# THE IRON AGE

New York, February 8, 1917

ESTABLISHED 1855

VOL 99: No. 6

# Cast-Steel Pipe for High Pressure Mains

The Largest One for This Purpose Ever Made—Increasing Use for Fire Protection in Large Cities

HE use of cast-steel pipe for high-pressure water mains for fire - fighting purposes in the large cities has become quite general in the past few years. As the height of buildings has increased and the demands for fire protection have become more exacting, greater water pressure in certain districts has grown to be a vital necessity. In not a few cases this exigency has been met,

in cities like New York, Philadelphia and Pittsburgh by the installation of a special high-pressure pipeline fire system, independent of the regular mains,

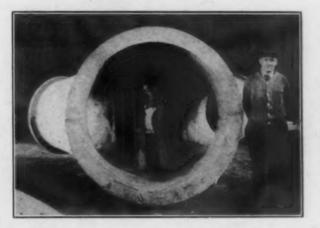
for the use of the fire department only.

Cast-steel pipe has come to be employed widely for this purpose, especially where the stresses are great. Confidence in the worth of such pipe has also been strengthened by the advances made in steel foundry metallurgy. Many shapes and sections, formerly regarded as only reliable if made of cast iron, or forged iron or steel, are now satisfactory as steel castings.

The two illustrations on this page represent probably the largest cast-steel water pipe for highpressure service ever made. While this one is intricate in design as well as large in size, foundries specializing in this work have made many of smaller

size and varied design to meet special requirements for the high-pressure lines. The success which has attended their use has been established.

This particular casting was furnished the A. P. Smith Mfg. Company, East Orange, N. J., by the Penn Steel Castings & Machine Company, Chester, Pa., for incorporation in the high-pressure service of Pittsburgh. The size can be readily comprehended by comparison with the man standing beside it as



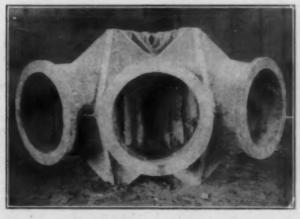
well as by its shipping weight, which was 21,-390 lb.

In design it is unusual and hence presented several intricate foundry or molding problems, especially in core work. It will be noticed that it is a 3-way pipe; that is, it has three branch arms similar to a Y, the extra one being in the middle in direct line with the one main opening at the back, so to speak. This design in itself pre-

sents difficult molding and core problems. Added to this, however, is the incorporation in the design of six sleeves or hollow sections, extending from one side of the pipe to the other and constituting a part of the solid body of the pipe—something which it is believed has not been attempted before with success. These hollow sections, which are visible in the photographs, form the encasing for the holding-down bolts which fix the casting to its foundation. Otherwise it would have been necessary to bore holes in the pipe, insert the bolts and then protect them properly from corrosion, etc., at the same time probably weakening the pipe itself.

A steel foundryman will at once appreciate the core and other problems here involved. And not only these, but shrinkage and metal problems demanded special consideration because of the ten-

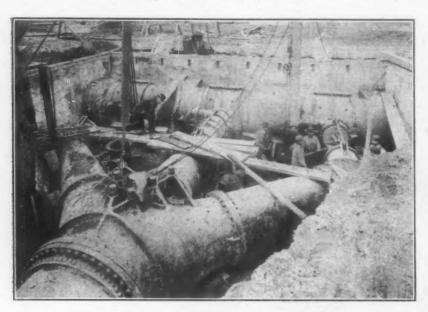
dency to develop cracks or strains, especially in the intricate sections. The core problems were successfully solved and the casting itself, the only one made, was entirely satisfactory. About 35,000 lb. of steel was required to pour this casting, which had a wall thickness of about 21/2 in. The steel incorporated was mediumcarbon acid open-hearth steel with a fairly high manganese content about 0.75 to 0.80 per cent-insuring a tough but ductile steel of high



The Six Hollow Cylinders or Sleeves, Cast Solid in the Pipe, Are Plainly Visible in This and the Illustration Above. They are used as encasements for the holdingdown bolts

tensile strength. Careful and thorough annealing was the only heat treatment necessary.

The third illustration shows the function which the large casting was called upon to fill in Pittsburgh's high-pressure water service. Its connection with the main water line is apparent as well as the three branching lines. In particular, however, one can see how the holding-down bolts were applied, the end of each one being visible. It is not known



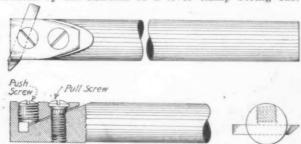
The Position of the Large Pipe in Pittsburgh's High Pressure Fire Service System. The six holding-down bolts are easily detected

whether other pipes just as large and intricate have been made for other systems, but cast-steel tees, elbows and regular sections were made by Chester, Pa., foundries for incorporation in the extensive high-pressure fire-main service which the city of Philadelphia completed a few years ago.

The application of cast-steel pipe to other service requiring high-pressure is expanding, especially in boiler castings and steam pipe lines.

#### A Boring Bar with a Lever Clamp

The line of boring bars and bar holders of the Rigid Tool Company, Washington, D. C., which was illustrated in The Iron Age, Sept. 2, 1915, has been increased by the addition of a lever clamp boring bar.



The Power Available for Clamping the Cutter and the Elimination of Special Wrenches Are Two Features of This Recently Developed Boring Bar

It is a self-contained unit in which special wrenches are not required. The cutter, as will be noticed, is located below the center of the bar, which is designed for insertion in a standard holder having a round opening.

The Canton Sheet Steel Company, Canton, Ohio, has started the erection of its new open-hearth steel plant, which will include three 50-ton furnaces and a continuous blooming and sheet-bar mill. The Canton Bridge Company has been given the contract for the buildings.

# Preventing Pipes in Ingots With an Electric Arc

Producing sound steel ingots or castings by maintaining the steel in a molten condition at the top of the ingot or casting by means of an electric arc, of which the metal itself forms one of the electrodes, has been patented in Great Britain by Armstrong, Whitworth & Co. in conjunction with Law and Sandberg, accord-

ing to the London Iron and Coal Trades Review. The arrangement is as follows:

At the bottom of the moid, and resting in its base, a plate of steel is provided, with a tongue protruding beyond the mold to which is connected one of the electrical leads, the other lead being connected to an adjustable electrode. To prevent the escape of heat when the electric arc is in operation, a cover is provided for the mold with a hole for the electrode to pass When an ingot is to be cast. through. the contact plate is placed on the base, the mold is placed in position and the metal is poured into the mold. soon as possible after the mold is filled, the cover and the electrode are lowered into position over the top of the ingot and the current is switched on. The current passes on the one hand through the base plate, and through the metal of the ingot, which by partial welding is maintained in good contact with the plate, and on the other hand the current passes through the other lead and the electrode, and thus an arc is formed between the molten metal at the top of the mold and the electrode. The heat produced maintains the metal

at the top of the ingot fluid until the rest of the ingot has solidified, and thus prevents the formation of piping, blow holes or segregation. When the ingot has cooled, the tongue is knocked off, while the base plate, which is now firmly welded to the ingot and forms part of it, is removed with the crop end from the bottom of the ingot.

### New Method to Reduce Piping in Ingots

Excellent results in reducing the piping in steel ingots and castings are claimed for the use of a mixture invented by James E. Shaeffer, Burnham, Pa., and described in U. S. Patent 1,212,825-Jan. 16, 1917. It has been the practice, says the patentee, to place a layer of plumbago on the top of the molten metal in a mold so as to reduce the depth of piping, but its cost led to trials of other materials. The new compound is a mixture of pulverized anthracite coal, mixed with a petroleum oil, the oil being in such proportions as to make a plastic mass which is placed on top of the molten steel immediately after it has been poured in Because anthracite coal has a tendency the molds. to coke together during combustion and form a clinker. the coal alone cannot be successfully used to protect the surface. Instead of following the contour of the steel as it cools, the coal tends to clinker, thus bridging over the space, holding the protecting coal away from the steel at one or more points. The addition of petroleum is claimed to overcome this tendency so that the protecting compound will follow the contour of the steel as it cools, affording efficient protection. The mixture recommended is one quart of petroleum oil to 100 lb. of carbonaceous material. Other hydrocarbons may be used, such as paraffin.

The foundations for the blast furnace and the accompanying four stoves now being built by the Whitaker-Glessner Company at Portsmouth, Ohio, are about ready for the steel work, which will be pushed. The company and other local interests are erecting an adjacent by-product coke oven plant to furnish the necessary coke. The furnace will probably be ready for blast late in the summer and the coke plant not long afterward.

# Sensitive Multiple Drilling Machine

A small sensitive multiple-spindle drilling machine has been placed on the market by the Fox Machine Company, Jackson, Mich. It is designed for light drilling, countersinking, etc., and is intended for either floor mounting, as shown, or for use on a bench. Various arrangements of the heads with different numbers of spindles can be furnished, as well as cluster plates for use on complicated layouts where the



Various Numbers of Spindles from 2 to 16 and Cluster Plates for Use with Complicated Layouts where the Regular Type of Head Cannot Be Employed Can Be Supplied for This Small Sensitive Multiple-Spindle Drilling Machine as Well as Special Fixtures and Different Sizes of Tables for Mounting on the Base in Place of the Regular Table Which Is a Separate and Readily Removable Casting

standard spindle arrangements cannot be employed. The machine is regularly built as illustrated, the base and column being of box construction. If desired, the base can be mounted on a thin plate for use as a bench machine. The table is cast separate from the base, thus enabling various sizes of tables or special fixtures to be employed. A wide oil flange is provided for the table, as well as an oil drain pocket protected with a wire screen.

Round heads either 9 or 12 in. in diameter are regularly furnished equipped with 2 to 10 spindles 1 in. in diameter, or 2 to 16 spindles ¾ in. in diameter. These spindles are of crucible steel and provision has been made to take care of the thrust upon the ball bearings, an arrangement which tends to reduce the strain at this point. A six-armed pilot wheel, keyed to the rack pinion shaft, is relied upon to give sufficient leverage for easy drilling. The rack pinion is heat treated and is also keyed to the shaft.

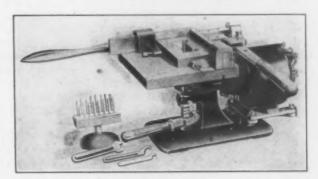
Open-hearth machinery steel is employed for all of the pinions, which have double bearings turned integral with them. The gears run in an oil bath which provides proper lubrication. A new type of adjusting arm is furnished which, it is pointed out, permits the adjustments to be made quickly and holds the bearing securely to the arm itself. The universal joints are of the builder's standard type and are composed of but three wearing parts. The two forks and the center block are milled from the solid metal and hardened and in the construction no pins, screws or rivets of any nature are used.

### Special Cutter Die-Forming Machine

The die-forming machine of the Anderson Die Machine Company, Bridgeport, Conn., which was illustrated in The Iron Age, Dec. 7, 1916, has been further developed. The changes include the use of superhelical cutters to provide clearance and the addition of a universal pivoted feeding mechanism to control the die while the cutter is operating.

The clearance required in some types of blanking and forming dies is secured by tapering the cutter, which has its axis at a right angle with the table or platen on which the die rests. In this way it is pointed out that the clearance produced in the die is equal to the degree of taper on one side of the cutter irrespective of the direction from which the die is applied to the former.

The universal pivoted feeding mechanism is of simple construction. The die that is being made rests upon the table or platen and is secured to an arm or fixture by a pair of adjustable dogs or clamps. The



A Universal Pivoted Feeding Mechanism Is Provided for Controlling the Superhelical Cutters Employed in This Special Die-Forming Machine During the Cutting Operation

fixture also rests on the table and is pivoted to a lever at the rear which has a series of holes spaced about 1 in. apart. A plug can be inserted in these holes after passing through one side of a forked projection which is relied upon to locate the fixture and die so as to reach the opening in the latter. The lever in turn is pivoted to an arm extending from and fastened to the table, the pivot point being adjustable to enable the fixture and arm to be moved to reach any portion of the die.

After the fixture and lever have been adjusted to the best location with respect to the opening in the die, the machine is started. The die is then fed or guided so as to finish practically any outline without, it is explained, the operator touching the work with his hands. While this arrangement relieves the operator of the necessity of holding the die with his hand, it is pointed out that the mechanism is sensitive and intricate outlines can be followed without difficulty. If the operator should desire to feed the die by hand in fitting a template, it is possible to remove the fixture in 5 sec. and place it on the bench, thus leaving the platen free.

Authorities on ceramics will talk on the manufacture of chemical and electrical porcelain in the United States at a joint meeting of the American Electrochemical Society, American Chemical Society and Society of Chemical Industry to be held at the Chemists' Club, New York, on Friday evening, Feb. 9. The cl speakers will be L. E. Barringer, Schenectady, N. The chief president of the American Ceramic Society and chief engineer of the department of insulation of the General Electric Company, and Charles F. Binns, Alfred, N. Y., director of the New York State School of Clay Working and Ceramics at Alfred. Before the war we imported all of our better grades of porcelain and ceramics, but are now making products which compare very favorably with the products formerly imported. It is claimed that in the manufacture of electrical porcelain we excel all other countries. Samples of some recent products will be shown at the meeting.

# A New Converter Steel Casting Plant

Otis Steel Company Provides Adjunct to Its Open-Hearth Foundry—Electric Hoist to Convey Sand—Location of Locker Rooms

FTER having been engaged for 30 years in the manufacture of open-hearth steel castings, the Otis Steel Company, Cleveland, Ohio, recently commenced the production of converter steel castings in a new plant adjoining its open-hearth foundry. The establishment of the jobbing converter foundry was due to the increase in the demand of the trade for small steel castings, particularly from automobile manufacturers. In the open-hearth foundry castings smaller than 10 lb. have not been made. In the converter foundry the range in size is from 2 oz. to 100 lb., although the practice will be followed of making castings larger than 50 lb. in the open-hearth foundry. The latter specializes in gears and rolls for steel plants but makes a wide variety of large steel castings and has been producing castings down to 10 lb. each. With the two plants the company's range of output is from 2-oz. to 140,000-lb. castings.

The new converter foundry occupies the building formerly used as a forge shop but well adapted to foundry purposes. This has been extended on one side by a lean-to used by the cleaning department, core room, converter charging floor, and blower room, and adjoining this is a new sand house and pattern storage building. The main building of the converter foundry is 118 ft. long and 125 ft. wide. Of this space 118 ft. x 57 ft. is occupied by the molding and casting floor; 35 ft. x 68 ft. by the core room and core ovens, and 46 ft. x 68 ft. by the

grinding and cleaning department. The cupola, converter and supply bins cover a space 37 ft. x 68 ft. The sand storage building is 35 ft. x 100 ft., the second story of the latter being used for pattern storage purposes. The foundry building is 29 ft. 6 in. in height to the roof which is of the monitor type, the height to the peak being 35 ft. The high building, with the monitor windows with large sections for opening, permits good ventilation so that the foundry is generally quite free from smoke. The molding floor is served by a five-ton Whiting Foundry Equipment Company crane, the crane runway being 20 ft. above the floor.

The foundry is conveniently arranged for the handling of material to insure economical production. The plant at present is in the form of an L, the sand house forming the leg of the L. With an extension to be built to the molding floor during the coming spring the plant layout will be more in the form of a U, the sand going in on one side to the core room and molding floor and the castings coming out on the opposite side of the same end of the building, with the melting units at one side of the molding floor near the center. The cleaning department will be moved shortly to a new building, 120 ft. long and 66 ft. wide, now being erected a short distance from the foundry. When this is completed the space now occupied by the present cleaning room will be used as additional molding floor



The Molding and Pouring Floor with the Cupola and Converter in the Background. The Toilet and Locker Rooms Are Built Above the Core Room in the Right Background.



An Electric Hoist Travels in a Semi-Circle from the Position in Which It Is Standing to the Molding Floor or Core Room, Carrying Sand and Removing Refuse. Ample Sand Storage Is Provided by the Pit in the Basement

space and castings will be conveyed by a yard engine from the foundry floor to the cleaning department, to which it will be connected by an industrial track. By thus separating the two departments the noise and dust of the cleaning room will be eliminated from the foundry. The present capacity of the plant is 150 tons of finished castings per month but this will be nearly doubled by the extensions which will include a second cupola and converter or an electric furnace. In arranging the plant, space has been provided for a second cupola.

#### The Melting Equipment

The melting equipment consists of a 34-in. cokefired cupola and a 2-ton side-blow converter of the Tropenas type. The blast is furnished by two Root blowers, one for the converter and the other for the cupola, the former driven by a 75-hp. and the latter by a 15-hp. General Electric motor. Space is economized by having the blower room on the ground floor, with a tool room above this on the mezzanine floor and the charging floor above the tool room. The pig iron, scrap and coke are conveyed to the charging floor on a 5-ton elevator. The usual charge is 25 per cent of steel consisting of gates and risers and also scrap produced in the company's plate and sheet mills. The remainder is low phosphorus pig iron, one half being high silicon iron.

The small cupola requires the breaking of the large low phosphorus and pigs in two sections. When the plant was started this was done with sledges but owing to the scarcity of labor and high wages a more economical method was devised by carrying the iron to the charging floor level and dropping the pigs from there 20 ft. on to the edge of triangular cast steel blocks placed on the bumper

at the end of the railroad siding, adjoining the charging floor and then taking the broken sections back in the elevator.

The metal is transferred from the cupola to the converter in 3-ton Whiting ladles, two of which are provided. Natural gas is used for heating the ladles, this being preferred to coke since the gas can be shut off when not required. The usual practice is to tap the converter into a 2-ton ladle, although a 1000-lb ladle is sometimes used. One-quarter to one-half of the metal from a 2-ton ladle is poured into 1000-lb. bull ladles and the remainder of the metal is then poured from the large ladle directly into some of the large molds. All handling of molten metal is done with the travelling crane.

A monorail system, with a switch and two branches at the entrance to the foundry from the sand house, is provided for conveying sand to the plant, one track leading to the molding floor and the other to the core room. On the tracks is operated a 5-ton electric traveling hoist furnished by the Euclid Crane & Hoist Company. The same hoist conveys refuse from the foundry to the yard outside. The sand, after being prepared in a grinding mill, is placed in boxes to be carried away by the hoist. Sand is shoveled from cars into the sand house through ports in the side wall. A large uncovered basement section is provided in the sand house, this furnishing ample storage space for sand for winter use, the storage capacity being 1000 tons. This is taken from the basement as needed with a grab bucket attached to the hoist.

#### The Drying Ovens and Cleaning Apparatus

The oven equipment includes one battery of 2-car core ovens, one battery of three rolling drawer core ovens, and one battery of four mold drying ovens, each containing two cars. The car core ovens are 3 ft. wide and 6 ft. 10 in. long; the rolling drawer core ovens 3 ft. wide and 6 ft. long, with four drawers in each ranging from 8 to 24 in. in depth and the mold drying ovens are 5 ft. wide and 15 ft. long. The ovens are coke fired, being of the underfired, draft regulated type, and are placed back to back with a pit between, the drying ovens being on one side facing the molding floor and the core ovens on the opposite side facing the coremaking floor. The ovens were built by the Foundry Equipment Company, Cleveland. The monorail track to the core room extends over the pit between the ovens for supplying coke and removing ashes.

At present most of the molds are made by hand in snap flasks. About 75 per cent of them are floor work and 25 per cent bench work. Two Mumford jarring machines are now in use and other molding machines will be installed. Sand rammers furnished by the Cleveland Pneumatic Tool Company are used for ramming molds. Molds are made in both green and dried sand, the latter being used when the castings are to be machined all over to eliminate the danger of blowholes. Some of the recent products in thin section castings include washers and wrenches with sections 1/4 in. in thickness. Some of the snap flask molds are placed in wooden frames for pouring, about a dozen being placed in one frame and the sand packed around them, this practice being followed because of an insufficient supply of slip jackets. Green sand molds are skin dried with a Hauck Mfg. Company's oil torch, which is also used for firing the cupola, and sometimes, when the gas supply is short, for heating the ladles.

The cleaning room equipment includes grinders, air hammers, and oxyacetylene torches for cutting. The new cleaning department will be provided with an annealing oven, sand blast, tumbling barrels and other equipment. When heat-treating facilities are provided by installation of the annealing ovens considerable attention will be given to the production of high grade and alloy castings.

#### Unique Location for Locker Rooms

The toilet and locker rooms are located directly under the roof in the side bay and over the core room where good light and ventilation are provided. These are built of concrete and are reached by a convenient stairway and their location means the saving of considerable floor space. The toilet room has a cement floor which permits its being washed out daily with a fire hose. Individual closets and urinals, as well as showers and metal lockers are provided, all the equipment being of the best quality. The employees, in addition to taking advantage of the showers at the conclusion of their day's work, use them for their baths Saturday afternoon, bringing their clean clothes to the foundry.

In connection with the foundry are metallurgical, chemical and physical laboratories equipped to make all United States Government tests.



Two Types of Modern Core Ovens, Two Having Cars. The Other Is of the Rolling Drawer Type, Very Convenient for Small Cores



An Electric Elevator on the Outside of the John A. Oberhelman Foundry, Cincinnati, Serves the Cupola Charging Floor and an Air Lift on a Traveling Crane Helps in Loading Finished Castings

### Handling Materials in a Cincinnati Foundry

An interesting equipment for handling materials and castings has been installed by the John A. Oberhelman Foundry Company, Cincinnati. Pig iron, coke and sand are delivered to bins or yard storage near a Warner electric elevator on the outside of the building and used for delivering materials to the cupola charging platform. Before the railroad siding was secured through moving into its new plant, deliveries had to be hauled by horse-drawn vehicles. Besides effecting a reduction in the cost of handling materials, the railroad facility now provides for railroad shipment of castings in an expeditious manner. Finished castings are carried by cranes to a scale at the end of the building and after weighing are deposited on cars operating on an industrial railroad track. The castings are loaded on the railroad cars by means of a Curtis air hoist attached to a traveling crane, as indicated in the accompanying illustration. Incidentally, this crane is used for unloading bulky incoming freight.

A record of 12 months preceding the move into the new plant, which is on Colerain Avenue, showed that drayage expenses figured about as follows: Pig iron, 63 cents per ton; coke, 74 cents per ton; sand, 75 cents per ton. It is estimated that the general average cost was 70 2/3 cents per ton. The present handling cost for incoming carload shipments is stated as 10 cents per ton, thus indicating a saving of about 60 cents per ton. The company owns the side track and there are no railroad spotting or switching charges on inbound cars.

A 5-ton Pierce-Arrow truck is now used for delivering castings to nearby purchasers. This has taken the place of two teams. A recent record of the truck was to make three trips in one day with practically a full load of castings in each trip. One trip was to a machine-tool plant in Covington, Ky., 5½ miles distant; another to Linwood, a suburb 5 miles away, and a third to Norwood, about 4 miles, the total distance traveled being thus approximately 30 miles. In addition the truck stopped on one return trip to pick up a less-than-carload shipment. It is estimated that it would have required two

teams two full days to have made the deliveries. The investment represented in the two methods of making deliveries is substantially the same, so the saving appears in time and decidedly higher delivery capacity. Maintenance expenses, it is added, figure out in favor of the truck delivery.

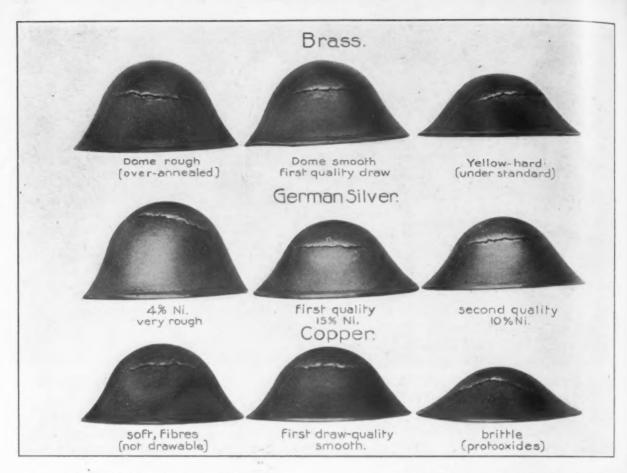
The office is located on the curb level of Colerain Avenue and the foundry floor is 15 ft. lower. A glass door at the head of the steps to the foundry enables the superintendent to get a full view of the plant at all times. Underneath the office two washrooms are located, one for the white workmen and the other for the negro laborers. Hot and cold shower baths are provided and each man has an individual locker.

The company makes a specialty of machine-tool castings and also specializes in heavy work of all kinds.

#### A Large New Graphite Deposit

Search for graphite deposits in the United States since the war started has brought to light the largest known deposit of high grade mineral on the continent, says the New York State Department of Labor. It is between Lake George and Lake Champlain in the vicinity of Black Mountain. The famous mine opened by the Joseph Dixon Crucible Company in 1878 is in this section and in the same geological horizon. This mine is still being operated but the new one is said to be several times as large as the Dixon deposit. The veins crop out for nearly a mile with a thickness of 50 ft. The graphite content indicates a variation of 6 to 10 per cent of the large flake variety desired by crucible makers while a 6-ft. layer assays over 15 per cent of high grade graphite. The property is owned by Hooper Brothers, Whitehall, N. Y.

The Richardson-Phenix Company, lubrication engineer and manufacturer, Milwaukee, Wis., announces the opening of a sales office in Cleveland, located in the Builders' Exchange, in charge of W. J. Oettinger. This became necessary to take care of the company's increasing business in Ohio. Mr. Oettinger is stated to be well qualified to handle the engineering details of all problems connected with the scientific lubrication of machinery and the installation of systems for circulating, filtering and sterilizing cutting oils and compounds.



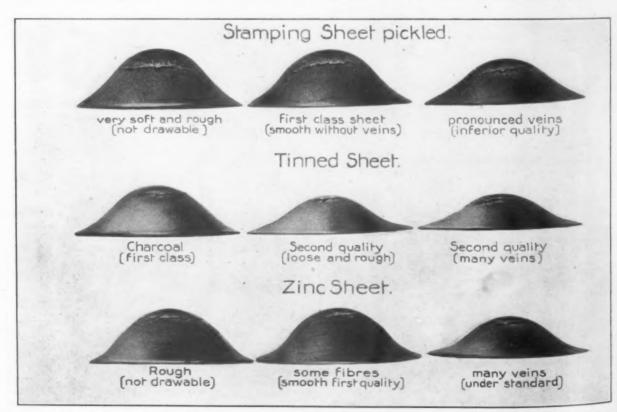
#### TESTING METAL SHEETS

#### Some Practical Results When Using the Erichsen Machine to Determine Workability

A MACHINE which is claimed to determine directly the workability or the drawing, stamping, compressive and folding qualities of various kinds of metal sheets is known as the Erichsen, invented by a Norwegian metallurgical engineer, A. M. Erichsen. As

applied to sheet steel it was described in The Iron Age, July 23, 1914, where the details of its manipula tion were discussed as well as the advantages.

The sample of sheet metal to be examined is held between a die and a holder and a tool actuated by a ram and a handwheel is moved gradually forward until fracture of the sheet takes place. The depth of the indentation is then read off directly from microm eter scales; and forms the basis of workability determinations. By the use of special attachments the ma-



These Two Illustrations Show Some of the Results Obtainable When Testing Metal Sheets with the Erichsen Machine.

chine can also be adapted to similar tests on strips, wires, cartridge cups, coin blanks, etc. The test piece should be carefully observed for the following points:

1. Whether the break is round or whether it occurs prematurely in some special way. In the latter case the material is fibrous and not very suitable for drawing or folding. This is also shown by a comparatively low drawing value.

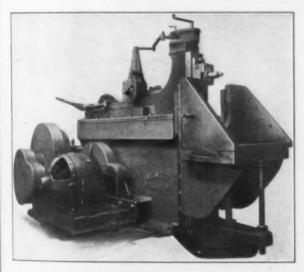
2. Whether the surface of the depression is smooth, like the original sheet, or is raw. If the latter, then again the material is not suitable for deep drawing and stamping, the rough surface offering increased resistance. A premature break with repeated drawing is the result, even if the material appears to be otherwise all right. This appearance is often found in sheet steel and indicates over-annealing.

3. Whether the surface of the depression shows very fine small cracks. This applies to copper and tin.

The illustrations show some of the results obtained on brass, German silver, copper and other sheet metals when tested in the Erichsen machine. It is evident that the appearance of the metal after testing allows valuable conclusions to be drawn regarding faulty mechanical or thermal handling of the material. The manufacture and sale of the machine in the United States is now controlled by Herman A. Holz, 50 Church Street, New York City. The inventor was in the United States last December, purchasing equipment for a plant for making cold-drawn steel in Norway.

### Shaping Machine for Locomotive Boxes

A machine for shaping the collar fits in steel locomotive boxes has been built by the Newton Machine Tool Works, Inc., Philadelphia, for a large locomotive builder. It is equipped with a vertical feed and supplements a 30-in. stroke shaping machine with circular feed which was furnished the same firm some time



A Vertical Feed and an Angle Blade for Mounting Horizontally the Part to Be Machined Characterize This Machine for Shaping the Brass Fits in Locomotive Boxes

ago for shaping the circular fits in Cole and similar design steel locomotive boxes.

In general the machine is of heavy box type construction with hand elevation to the knee and a slight amount of hand cross adjustment to the angular blade to which the boxes are bolted and the ram, which is a very heavy construction. The drive is similar to that incorporated on a crank slotting machine and employs a connecting rod and a Whitworth motion to provide a quick return stroke. The feed on this machine, as well as that on the earlier one, is accomplished by a pawl engaging an incline, this arrangement, it is pointed out, insuring a definite amount of feed at each stroke.

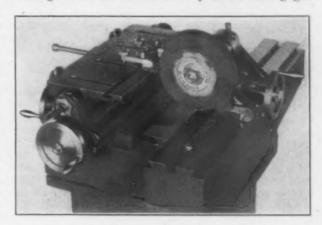
The machine is motor driven, a 15-hp. motor having a speed range of 400 to 1200 r.p.m. being recommended. Each of the machines weighs approximately 30,000 lb. exclusive of the driving rooter.

exclusive of the driving motor.

The boxes are placed in a horizontal position for machining, and it is stated that this arrangement has worked out satisfactorily since the marks which must be worked to are readily visible.

#### Universal Grinding Machine for Gages

A gage grinding machine designated as its No. 1 universal style has been brought out by the Steel Products Engineering Company, Springfield, Ohio. It is designed for all classes of snap and master gages.



Snap and Master Gages of All Kinds Are Fastened on the Flat Working Surface of This Universal Grinding Machine by Strap Clamps and T-Slots

The wheel spindle is of the floating type with a sensitive adjustment for taking up contraction and expansion with a screw and lock nut. The spindle runs in bronze bearings and is lubricated by a series of oil grooves through which the feed is by centrifugal force from a receiver at each end. The spindle head has a transverse movement of 17½ in. The cross-feed is operated by a hand lever and rack and pinion. A fine pitch screw and handwheel provide an additional feed when accuracy is required to get a fine smooth finish.

The table is of ample size and has a flat working surface on which the work is fastened by strap clamps and T-slots. A setting gage is used for duplicating work. The table may be tilted up or down to allow the grinding of thick or thin gages and still keep the center of the work on a line with the center of the wheel. The table may be traversed 4¼ in. by a screw and handwheel and an additional 17½ in. in the same direction by the head adjustments.

The machine takes an emery wheel up to % x 6 in, with ½-in. hole, and its capacity is 4½ in. in depth and 21% in. in length.

#### Michigan University Industrial Fellowships

Seven industrial fellowships are given by the department of chemical engineering of the University of Michigan, Ann Arbor, Mich. They are established through the donations of private corporations for research in the fields in which the corporations are interested. The results of the investigations are published by the university. Application for a fellowship must be made before March 1. The Detroit Steel Castings Company has given \$600 for study of methods to produce better steel castings. The same amount has been donated by the Detroit Copper & Brass Rolling Mills for the investigation of methods to produce better copper and brass products. A fellowship for the investigation of materials used in the construction of central station equipment has been established by the Detroit Edison Company.

The National Daylight Association was formed at the Hotel Astor, New York, Feb. 3, at the closing session of a convention attended by numerous business men from various sections of the Union. Marcus M. Marks, president of the Borough of Manhattan, New York City, was chosen president, and a number of vice-presidents, representing various sections of the country, were named. A resolution was also adopted suggesting that Congress be urged to set an early day for a hearing on the Borland bill to set the clock forward an hour during five summer months.

# Chamber of Commerce of the United States

National Defense an Absorbing Topic at Last Week's Meeting in Washington—After War Trade, and International Consideration of Immigration and Commercial Arbitration Discussed, Also Daylight Saving, Vocational Education and Railroad Strike Legislation

HREE thousand business men, many of them of national prominence, attended the fifth annual convention of the

Chamber of Commerce of the United States of America held in Washington Jan. 31 and Feb. 1 and 2. It was much the largest gathering in the history of Meeting under extraordinary conthe organization. ditions, in the shadow of impending war, the delibera-tions of the delegates were unusually impressive: Much of the time of the convention was given up to the consideration of the problems of military and industrial preparedness, business problems that will confront the country when the European conflict is ended, the desirability of a national plan of daylight saving, the speedy upbuilding of the American merchant marine and collateral issues. Other important subjects engaging the attention of the convention were the legislation necessary to prevent railroad strikes and to effect other reforms in the supervision of the common carriers of the country, the necessity for federal participation in providing means for vocational education, the importance of a standardized system of internation commercial arbitration, the prime necessity of reasonable immigration laws without literacy tests, the great need for a law providing uniform negotiable bills of lading and the desirability of supporting the Federal Trade Commission in working out the lines of a national policy of trade ethics.

#### National Defense an Engrossing Topic

The subject of the national defense was an engrossing topic and was touched upon at nearly every session until former President Taft who, in the absence of President Wilson, was the only speaker at the banquet which closed the convention, urged the taking of prompt and energetic steps for the protection of the Nation's honor to be followed by the organization of the much discussed World League to Enforce Peace.

In a report made by the Committee on National Defense by Bascom Little, Cleveland, the Chamber was urged to "pledge the unqualified support of the business interests represented within its membership to the Council of National Defense and to the active consummation of its plans." Details of the Chamber's recent referendum on this subject were presented by the committee, showing that on the broad recommendation that the national defense forces of the United States both on land and sea should be so increased and the industrial resources so co-ordinated as to make fully available the military, industrial and financial strength of the nation the vote of the membership was nearly unanimous—a total of 970 in favor with but 8 votes opposed.

"The difficulties of supplying some of the needed materials for the Government, notably shown in the recent controversy concerning large caliber shells," said the committee's report, "should not be encountered by a Government department. Your committee is in no position to express any opinion as to the merits of this particular case, but is decidedly of the opinion that no real progress can be made until a new basis of friendly co-operation is established between the supply departments and the manufacturers who are producing the needed supplies. It is hoped that one of the great constructive tasks of the Council of National Defense will be the creation of an improved attitude. It seems clear to the committee that the Government, in so far as its needs for defense are concerned at least, is in no sense an ordinary customer of an American industry."

The committee also called the attention of the Government and the public sharply to the waste which must occur if the organizations, painfully trained during more than two years of industry by American manufacturers to fill foreign war

orders, be permitted to disintegrate when peace is declared in Europe and the war orders stop. It was suggested in this connection that a system of registration, or in certain cases actual purchase by the Government, of plants might be worked out to prevent this waste.

#### Mobilizing Citizens According to Fitness for Tasks

The committee also emphasized the importance of mobilizing workers in all ranks and giving official recognition to the fact that industrial workers are a part of the defensive force of the country. The obligation of each man to bear the burden of national defense in the way he is best fitted to do it should by education be instilled into the mind of every citizen from the laborer to the millionaire. The plan advocated by the Chamber, according to the report, would entail service in the industrial as well as the military establishment and insure every man's rendering service in the particular field where his training would make him most effective. Some would shoulder rifles, others operate machines or dispatch trains, while still others would manage communications and finance.

Howard E. Coffin of the Naval Consulting Board, emphasized some of the leading points in Mr. Little's report on the national defense. "It is upon organized industry," he said, "that we in the United States must base any and all our plans for a military defense and, in the event of trouble with any of the first class powers, between 80 and 90 per cent of our industries would be centered upon the making of supplies for the Government. From one to two years of time and effort are needed to permit any large manufacturing establishment to change over from its usual commercial peacetime work to the supplying of war materials. After two years of diligent work 20,000 inventories are now on file with the Council of National Defense.

"Munitions must become our one great national undertaking and we must make our plans accordingly. Every manufacturer owes it to himself, to his stockholders and to his workmen to insure against a prolonged shut-down of his plant. The ability to swing quickly from the commodities of peaceful commerce to the production of the emergency materials of war will constitute the greatest insurance against Government control, against disruption of organization and against months of community chaos which cannot but spell physical suffering and privation to labor and money loss to the business itself. The interests of Government, capital and labor are common interests in war, and it is only through prearrangement as to production, profits, wages and relations that the national welfare may be safeguarded."

The report of the National Defense Committee was adopted without a dissenting voice.

#### Against Excess Profits Tax as Proposed

The Chamber also pledged itself to support any just and reasonable measures of taxation which the Government may see fit to adopt, but protested against "the inequitable and discriminatory methods of taxation proposed in the bill providing for a tax on excess profits of corporations and copartnerships."

American business men were warned by Dr. Leo S. Rowe, secretary-general of the International High Commission that they cannot hold the trade they have obtained during the war, especially that secured in South America, unless they are prepared to make special ef-

fort and to modify many of their practices when the European war is over. Throughout Latin America, he said, there was a feeling of irritation because of high prices exacted by manufacturers. Business men in South America believe their temporary needs are being exploited without any attempt to lay the foundations for permanent commercial relations and many merchants are eagerly awaiting the opportunity to resume their former connections with English and German houses.

#### Local Treatment of Foreign Trade Problems

Wallace D. Simmons, president Simmons Hardware Company, St. Louis, urged the necessity for special education for foreign trade. Pointing out that the subject is not one for federal action, and if left to the States might be indefinitely delayed, Mr. Simmons said that "by reason of direct vital interest it seems to be the concern of local Chambers of Commerce and organizations of like character throughout the entire country." If they will take hold of it promptly, appoint well selected committees to go into it systematically and work it out as it can best be done in each community, a prompt and effective start may be made and we can get the benefit of all the best thought and planning that can be given to it by our business men and educators everywhere."

Secretary of Commerce Redfield urged the delegates to the Convention not to feel any anxiety in regard to an influx of cheap foreign goods upon the conclusion of the European war. "We see now," he said, "that with the war's close there will come demands for lumber, for cotton, for agricultural machinery and for finished forms of iron and steel of many kinds. We see more clearly that we must be called upon both for the funds and for the goods for rehabilitating a devastated Europe. Our part in the coming days of peace is to be one of initiative, of active reconstruction and not one of more or less feeble resistance to foes strangely grown powerful through terrible disaster."

#### Daylight Saving

The report of the special committee recommending a system of daylight saving by putting forward all clocks at least an hour over eight months of the year was adopted. Uniformity should be obtained, the report declared, "through an act of Congress establishing the time for each part of the country as one hour in advance of the present standard time." The desirability that Congress should exercise its power is manifested by the necessity of a uniform system of time. Unless clocks in Seattle, Denver, St. Louis and all other communities are moved forward one hour when clocks in New York and Boston are similarly advanced, inevitable confusion would result to the detriment of many of our most important business interests. The committee emphasized the importance of this daylight saving plan to the manufacturing industries which would be enabled to carry on their operations throughout nearly the entire day without the use of artificial light, thus effecting an economy and improving the quality of their output while at the same time saving the eyes of their operatives from undue strain.

#### Upbuilding of American Merchant Marine

That the rapid building up of the American merchant marine to a standard commensurate with our share of the world's commerce is not only demanded by our own needs but will tend to adjust and balance the carrying trade to the good of all other nations, was the conclusion of the Committee on the Merchant Marine. The difficulties of now accomplishing results have been greatly accentuated, it was pointed out, owing to the long duration of the war. European governments are conserving their shipping; foreign owners are not allowed to sell their vessels to aliens; yards abroad can only build ships for their own people; our own plants are under contract for one or two years ahead, and the situation is further complicated by the launching of the Government's increased naval program.

Attention was called by the committee to the fact that the National Chamber has consistently stood firm in its opposition to the Government's proposal to enter

the shipping business in competition with United States citizens. The recently created shipping board, it was suggested, would find an important function in making a thorough investigation of conditions in the American merchant marine with a view to advising legislation along broad lines to stimulate expansion. The increase of our foreign trade and its permanent protection, the report said, can only be conserved by an adequate merchant marine flying the American flag in order that we may no longer depend upon commercial rivals to carry our merchandise to the world's markets.

#### Anti-Strike Railroad Legislation

The Chamber adopted a vigorously worded report submitted by Charles F. Weed, Boston, chairman of the Committee on Railroads, urging legislation recommended by the President denying to employees of railroads the right to interrupt service before the public has been put in possession of an authoritative statement of facts. The committee expressed the opinion that as a matter of principle when a man enters the railroad service—a public service on which the health, safety and existence of the whole community depend—by that act he should surrender the right to join in concerted action to paralyze that service. The committee also urged that the public should be given a majority representation on any board of investigation or arbitration and that Congress should create under the Interstate Commerce Commission a permanent division to compile labor statistics and other data for the use of arbitration boards in all future railroad controversies.

#### Vocational Education

The report of the Committee on Vocational Education presented by Howell Cheney, South Manchester, Conn., declared that the establishment of vocational schools of manufacture, commerce, agriculture and home economics throughout the land is imperative and that federal aid and encouragement are essential. Referring to the vocational education bill now pending in Congress, the report declared that it would fail of its purpose if it did not stimulate the states to undertakings in vocational education far in excess of the amounts appropriated by the federal Government.

#### A System of International Commercial Arbitration

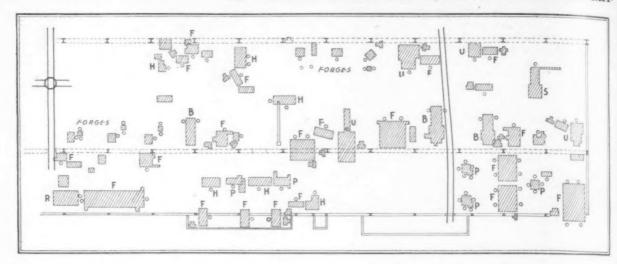
The Chamber adopted an interesting report on "Business Arbitration Agreements" presented by Owen D. Young, New York, vice-president General Electric Company, which told of the successful results obtained in connection with work on commercial arbitration between that company and Argentina. Arrangements have been completed for the settlement of trade disputes through the interposition of the Bolsa de Comercio de Buenos Aires and a code known as the American Argentinian Arbitration clause can now be incorporated in trading contracts, and, in the opinion of the committee, should result in better mutual understanding and the furtherance of trade between the two countries.

The adoption of this code now opens the way for similar agreements with other countries and this project, if supported in a whole-hearted manner by American business men, will at once afford a way for adjusting all well-founded complaints in accordance with their merits. Great power will stand back of arbitrators chosen under this code, as they will have behind them the organized business sentiment of the United States as represented by the National Chamber and of Argentina as represented by the Bolsa de Comercio de Buenos Aires. It is understood that England is contemplating a similar agreement with Argentina.

#### International Conference on Naturalization Proposed

America needs a sound admission and exclusion immigration law, according to the report of the Committee on Immigration of the Chamber. A domestic immigration policy for the distribution, protection and education of aliens during the period preceding their admission to citizenship is also needed and in the absence of such policies, according to the committee's report, we have

# A FORGE SHOP BEFORE AND AFTER MA.



THE plan immediately above and that on the opposite page represent the arrangement of machinery and equipment in a forge shop. The one plan shows the conditions before an effort was made to improve operations. The other shows the result of a relocation of the equipment without purchasing new machines. This pair of plans may be taken as supplementary to an article on "Relocating Equipment in a Machine Shop," printed in The Iron Age of Jan. 18 and likewise cover the work of Frederic Schreibman, consulting industrial management engineer.

Letters have been used to designate general classes of machine, as follows: B, bulldozer; P, press; H, ham-

mer; U, upsetter; F, furnace; S, shears and R, rivet machine. The small circles indicate the location of workmen. Two or more circles at a machine may denote either the necessity of more than one man or that a single machine operator may have to take several positions.

In a monograph on the subject Mr. Schreibman describes the machines in the plant when visited as thrown in every direction, "upsetters among bulldozers; shears among hammers; punches among drills; etc., and they are placed in the middle of the aisles. Furnaces are of all dimensions. Where a small furnace is needed, you will find a large one; and vice versa." He emphasizes

a badly adjusted labor supply with congestion in one place and rows of deserted houses in another. "Our place and rows of deserted houses in another. "Our chief immigration problems," said the report, "are the shortage of labor, the industrial training and Americanization of immigrant workmen and the keeping of workmen here after the war. With the close of the war we shall have to deal with trade adjustments in which this exchange of outgoing trained and skilled men and women for incoming inexperienced and perhaps physically inferior men and women will be very important factors. We shall also have a considerable redistribution of workmen among our own industries." port suggested that at the end of the war an international conference on naturalization be called to meet at Washington to formulate a general naturalization law which shall be proposed to all the countries of the world as the basis of new naturalization treaties.

#### Uniform Bills of Lading

A strong plea for the adoption of uniform negotiable bills of lading was made by a special committee of the Forgery must be guarded against and all Chamber. other fraudulent practices prevented if we are to protect our enormous export trade. Insurance policies also should be uniform and the committee expressed the opinion that "if every carrier issues the same form of bill of lading so that an insurance policy can be effected by the shipper which always will meet his requirements no matter to what country he ships or by what steamship line, it is of comparatively little importance whether the form is such that the carrier becomes an absolute insurer or is granted the broadest right of exemption." If only the forms of the bills of lading are uniform the committee thinks it then becomes merely a question of insurance. The only requisite is that there shall be no gaps between the bill of lading and the insurance policy.

#### Work of Federal Trade Commission

In addition to studying the numerous ramifications of the great problem of unfair competition, the Federal Trade Commission apparently has planned for developing the usefulness of trade associations and has already received great assistance from secretaries of such organizations, according to a report made by Harry A. Wheeler, Chicago. In the near future, the committee stated, the Trade Commission will issue a series of interpretations regarding the provisions of the Clayton act about inter-corporate ownership of stock and interlocking of officers or directors where commercial complication is involved. In this way, the committee said, "the Commission is working out the lines of a national policy of trade ethics, a policy by which everyone may definitely test his own enterprises and plans and which will be certain in applying both correction and encouragement."

#### Officers and Directors

Twelve directors were elected as follows: Frank H. Johnston, New Britain, Conn.; Lewis E. Pierson, New York City; R. T. Cunningham, Fairmount, W. Va. (reelected); R. G. Rhett, Charleston, S. C. (re-elected); Harry A. Black, Galveston, Tex.; Clarence H. Howard, St. Louis; L. C. Boyd, Indianapolis (re-elected); James Couzens, Detroit (re-elected); E. T. Meredith, Des Moines (re-elected); Thomas B. Stearns, Denver, Col. (re-elected); J. E. Chilberg, Seattle, Wash., and A. I. Esberg, San Francisco (re-elected).

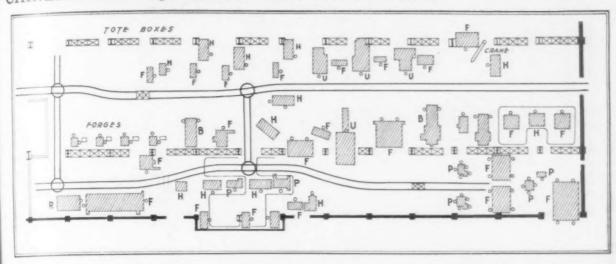
Esberg, San Francisco (re-elected).

The board of directors subsequently re-elected R. G. Rhett, Charleston, S. C., as president of the Chamber and Joseph H. Defrees, Chicago, Samuel McRoberts, New York, and Willis H. Booth, St. Louis, were chosen as vice-presidents, and John Joy Edson, Washington, was re-elected treasurer.

W. L. C.

The engineer officers' reserve corps of the Army has been enlarged by the approval by Secretary Lane of the applications of 93 topographic engineers in the United States Geological Survey, Department of the Interior, for commissions. Of the number 23 men have passed the necessary examination. The total number of applications for army commissions thus far submitted amounts to 80 per cent of the topographic field force of the Geological Survey.

# CHINERY AND EQUIPMENT WERE RELOCATED



how some machines were located to take the work in one direction and others in an opposite; that insufficient means were available for removing smoke and gases. Besides blocking paths in which a narrow-gage industrial-railroad track might be located, the congestion of some of the equipment, as at the shears, made it difficult to handle long bars, let alone providing space for their more or less temporary storage while starting through the processes of the forge shop.

The rearranged shop shows the provision of the narrow-gage tracking and also of the overhead trolley tracks for use at the heavier hammers. It also shows a scheme for the placing of tote boxes for material to

be forged and for finished articles ready for removal to another part of the works. Previously the materials in process were piled more or less indiscriminately, and convenient space near machines was commonly difficult to get because of the indefinite storage near hammers and presses of dies used more or less frequently. The tote boxes are of a special design of Mr. Schreibman's, arranged to fit one above the other and thus to be piled in some quantity, as on the transfer cars. It is intended to show later in these columns various forms of tote boxes which Mr. Schreibman has used. Some of these are of wood and others of strong steel slats, as for immersing articles in paint.

#### SHIPS LOST BY WAR IN 1916

# Statistics of Net War Loss to World's Merchant Marine in 1916

Washington, D. C., Feb. 4, 1917.—Figures showing the net results, to the world's merchant marine, of war losses in 1916, have been compiled by the Bureau of Navigation of the Department of Commerce. Taken in connection with estimates of losses from normal causes based upon the records of the past decade, they indicate a net reduction in the world's merchant shipping of approximately 1 per cent. In other words, the net loss in 1916 from all causes, including the war, has approximated 500,000 tons, leaving the total of the world's shipping Feb. 1, 1917, fairly close to 48,200,000 tons.

While it has been difficult for the Bureau of Navigation to obtain official information regarding the output of ships from the yards of the belligerent nations in the past year, owing to the secrecy maintained, especially on the part of the Teutonic allies, estimates based upon sources entitled to credence fix the total merchant shipping then built at 2505 vessels of 1,988,943 gross tons. This is a reduction of nearly 45 per cent, compared with the record output of 1913, which was 3,332,882 tons, but the difference is substantially accounted for by the fact that the facilities of the shippards in the belligerent countries were largely occupied with naval construction and repair work.

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The losses in 1916 through war causes, which can be accurately stated, have aggregated 1149 vessels of 2,082,683 gross tons, to which should be added about 300,000 tons representing ships wrecked, sunk in collision or abandoned. The so-called normal loss, as given in these figures, is much less than the average for the past decade. Several reasons account for this: 1. The large tonnage interned has been subjected to deterioration only and not to the risk of total loss. 2. The total destruction from war causes is credited with a certain

tonnage which, had there been no war, would have been lost in other ways. 3. Because of unprecedented freight earnings a very large tonnage has been kept in service which, under normal conditions, would have been abandoned. As illustrating the last-mentioned point, the Bureau of Navigation has recently been advised that a large steel cargo vessel, sunk off the coast of Brazil seven years ago and abandoned, has been raised and is now undergoing reconstruction with a view to making her thoroughly seaworthy.

her thoroughly seaworthy.

Figures secured by the Bureau from official and unofficial but reliable sources give the distribution of the world's merchant shipbuilding in 1916 as follows:

Built in United States	Vessels . 1,213	Gross Tons 560,239
minions Japan Holland Italy Norway Sweden France Denmark Germany Spain China	510 250 297 30 70 35 10 30 18	619,336 246,234 208,180 60,472 44,903 40,090 39,457 37,150 25,950 10,071 7,861
Total		1,899,943

The most significant feature of the above table is the relatively large output of the Japanese shipyards, which was nearly three times that of 1915, the increase being accounted for principally by the construction of a considerable number of large cargo steamers, some of which were built for foreign account. The output of the Holland yards would have been much larger but for difficulties encountered in obtaining materials. The total credited to Germany is probably much smaller than the tonnage actually constructed, as the figures here given represent only the work of which information has been received.

Attention is drawn by the Bureau to the increasing measure in which the American shippards are being devoted to the construction of steel cargo vessels, and the following table has been compiled to show the types

of steel merchant ships building or under contract Jan. 1, 1917:

Туре	Number	Gross Tons
Cargo vessels	 294	1,002,398
Oil and molasses tankers	 76	429,916
Passenger and cargo vessels	 7	50,728
Car floats and ferries		5,914
Towing vessels	 11	2,387
All others		4,258
m-4-1	400	1 405 601
Total	 403	1,495,601

It will be seen that cargo vessels constituted approximately 75 per cent of the steel construction on hand on Jan. 1 of this year, and that if the oil and molasses tankers are included in the cargo classification, as they very properly may be, the remainder of the tonnage is negligible.

W. L. C.

#### FERROMANGANESE IN 1916

# Records Broken—Spiegel Output and Ore Imports Unsurpassed—Apparent Supplies

Unusual strides were made in 1916 by the ferromanganese industry of the United States. This is also true of the spiegeleisen output. The ferromanganese production last year, according to the blast-furnace reports of THE IRON AGE, was 208,389 gross tons, exceeding that of any previous year and nearly double that of 1914, which was 106,083 tons. The spiegeleisen output in 1916 was 197,578 tons, also nearly twice that of 1914 and greater than any previous year. The combined output of the two manganese-iron alloys last year was 405,807 tons.

#### Production of Ferromanganese and Spiegeleisen

The following table, compiled from the monthly blast-furnace figures of THE IRON AGE, shows the combined and relative output of these alloys for a period of years.

Production of Ferromanganese and Spiegeleisen in the United States—Gross Tons

1912	245,576 206,448 239,824	20,407 20,464 17,204 19,985	Ferro- manganese 125,378 119,495 106,083 146,542	Spiegel- eisen 119,506 126,081 100,365 93,282
1916	405,807	33,817	208,389	197,518
1916	405,807	33,817	208,389	197,518

The monthly output for the year was therefore 33,817 tons as against 31,411 tons to Oct. 1, 1916, according to our last analysis of the situation in The Iron Age, Oct. 12, 1916. The largest ferromanganese production was 21,374 tons in October, with the greatest spielegeisen output at 26,236 tons in June. For the last seven months of the year the average ferromanganese production was 18,262 tons per month. The total of 405,807 tons in 1916 exceeds our estimate of 376,000 tons for the year, made in the last analysis referred to.

#### Imports of Ferromanganese and Manganese Ore

The ferromanganese imports of 1916, while larger than those of 1915, were below normal according to official figures furnished THE IRON AGE. The total was 77,836 gross tons as compared with 55,201 tons in 1915. The normal imports, judged by the average for 5 years (1910 to 1914), were 100,793 tons per year, making those for 1916 about 77 per cent of normal. The average monthly imports, for the 5-year period referred to, were 8399 tons; in 1913 the monthly average was 10,672 tons, but in 1915 it was only 4600 tons. The 1916 average was 6570 tons per month, a very good showing under the circumstances—about 65 per cent of normal.

A significant feature of the record for 1916 is the striking advance in our imports of manganese ore. Official records are available only to Dec. 1, 1916, but these show a total for the 11 months of 526,525 gross tons, exceeding any previous record. In fact they excel the total for the corresponding 22 months of 1914 and

1915 combined. The following table shows how these remarkable results compare with previous years:

	M	a	n	90	17	le	8	8	U	176	3	E.	m	ıр	0	ri	8	1	10	18	0		tl	B	e United States	
Per	in	3																							Total Fer Month	
1913 .																								0	. 345,090 28 757	j
																									. 283,294 23,608	
Avera	ge	S	f	oi		5	3	7 e	a	rs		Ċ	1	91	0		1	91	4	1	0 .		0 .	0 %	. 320,782 26,731 . 269,649 22,470	
1916 t	0	D	e	C.	1		(	11		m	0	n	t1	18	)						0 1	0	0	0	. 526,525 47,227	

The 1916 imports were double the normal as judged by the 5-year average which was 269,649 tons. Probably 95 per cent of this came from Brazil as the imports from India have been very small and those from Russia none. Our own production of manganese ore has been inconsequential when compared with our needs. In 1916 the manganese ore mined in this country is estimated at only 27,000 gross tons, the greatest since 1888, with but 9709 tons in 1915.

In contrast to our own manganese ore imports are those of Great Britain for 1916, which were only 439,509 gross tons, or nearly 120,000 less than ours. It is the first time that the British imports have been less than our own. The average for 1916 was 36,625 tons per month, against 31,443 tons in 1915 and 50,098 tons per month in 1913, when the total was 601,177 tons. Our 1916 imports were therefore not far from the British record in 1913.

#### Summation of the Data

A summary of the information contained in the foregoing analysis, taking the sum of the importations and the production of the standard 80 per cent ferromanganese as the apparent available supply for consumption, gives the following table:

Apparent Supply of Ferromanganese in the United States

	Imports, Gross	Production, Gross	Apparent Supply, Gross	Apparent Supply per Month Gross
Period	Tons	Tons	Tons	Tons
1912	99,137	125,378	224.515	18,709
1913	128,070	119,495	247.565	20,630
1914	82,217	106.083	188,300	15,691
1915	55 201	146,542	201,743	16.812
1916	77,836	208,389	286,225	23,852
Average for 5 yrs.				
(1910-14)	100.793	99.363	200.156	16,679

The apparent supply of 286,225 tons for 1916 exceeds the estimate of 270,605 tons made in the last review of this subject in The Iron Age, Oct. 12, 1916. While the apparent supply is not greatly in excess of that of 1913, this is accounted for by the fact that the British imports that year were abnormally large, the domestic output being nearly 50 per cent less than last year. The increase over the 5-year average is significant. The available supply per month has increased about 50 per cent over that of the 5-year average, or 23,852 tons compared with 16,679 tons.

#### Apparent Supply and Consumption

Our last analysis of the situation in The Iron AGE, Oct. 12, 1916, showed that, with a steel output in 1916 of 45,000,000 gross tons, about 304,634 tons of ferromanganese would be necessary to incorporate in this steel. Account was taken of the fact that about two-fifths of the Bessemer steel output is high carbon steel in which spiegeleisen can be used solely and that the open-hearth output was 73 per cent of the total, based on the 1915 and 1914 records. It is probable that our steel output last year did not exceed 44,000,000 tons. Recasting our computation made in October and using 17 lb. of ferromanganese as the average required per ton of steel produced, we have the following as the ferromanganese necessary in 1916:

	Gross Tons
44,000.000 x 0.73	= 32.120,000 open-hearth steel
44,000,000 - 32,120,000	= 11.880,000 Bessemer steel
$11.880,000 \times 2/5$	= 11.880,000 Bessemer steel = 4,752,000 high carbon Bessemer steel
11,880,000 - 4,752,000	= 7,128,000 low carbon besseling
32.120,000 + 7,128,000	= 39.248,000
39,248,000 X 17 = 667,	216,000 ID. = 297,864 tons of 1916

To supply this apparent necessary consumption we have 286,225 tons for the year, or an apparent deficit of only 11,639 tons.

If the open-hearth steel output was 75 per cent of the 44,000,000 tons produced, as some estimate, then the ferromanganese necessary for the year would figure out as 300,535 tons, making an apparent deficit of only 14,310 tons. If 19 lb. instead of 17 lb. is taken as the average amount necessary per ton of steel produced, as some contend, then the totals would be increased about 5,000 tons, making the deficits larger in each case, But it is believed that the 17-lb. estimate is nearer the actual than the 19-lb.

In any case account must be taken of the indisputable fact that, besides unusual economies in using the regular ferromanganese charges that have been practiced, a large amount of spiegeleisen has been used as a substitute in conjunction with ferromanganese. This fact is established by the large increase in its output which jumped to over 24,000 tons per month in November and December as against 12,000 to 16,000 per month in the months immediately preceding. It is reasonable therefore to infer that whether the apparent ferromanganese deficit be 10,000 or 50,000 tons, it has been met by economies and substitutes. Corroborating this hypothesis is the fact that the price of ferromanganese has fallen to \$164 to \$175 per ton while that of spiegeleisen has risen to \$60 to \$65 per ton.

Preceding analyses of the ferromanganese situation appeared in The Iron Age, Oct. 12, 1916, March 4 and Aug. 5, 1915, and Jan. 27 and June 15, 1915.

# Human Element in Shop Management

Conference Held in New York by Economic Psychology Association—Management, Selection and Care of Employees from a Scientific Angle

THE "Human Element in Business" was discussed at a conference of the Economic Psychology Association held at Columbia University, New York, Jan. 26 and 27. Papers were presented on the selection of employees, the training of an organization and practical methods of increasing the productivity of the human element in business.

#### Failures in Autocratic Shop Government

H. F. J. Porter, consulting engineer, New York, spoke on "Arousing the Initiative of the Workmen Through the Principles of Industrial Democracy." In business, he said, as in government, when a group became too large to be governed by a single leader, the subjects were divided into sections and assistants appointed to govern each. At this point the trouble The subjects were no longer led, but driven. began. A town grew up around the factory, and a man's right to govern his home extended to the right to govern the employees of his factory. As a result factory centers became autocracies. Development from that

stage to industrial democracy has been slow.

Under John Fritz, Mr. Porter continued, the Bethlehem Steel Company operated like a family. When his activity ended and the growth of the plant demanded some direct connections between management and employees, Mr. Porter suggested that Frederick W. Taylor be engaged. At that time the machine shop and forge were valued at \$1,000,000 each, but the machine shop was unable to keep up to the output of the forge. Under Mr. Taylor production was increased 500 per cent, so that the forge had to be enlarged to keep up with the machine shop; but in spite of this record of production, Mr. Taylor was not successful. He used the method of the autocrat, Mr. Porter asserted, and an upheaval of workers occurred as a result of the treatment. Mr. Porter was forced out with the Taylor faction. "But," said Mr. Porter, "I had learned my lesson. I was awake to the new order of things. The employees struck because their natural impulses had been killed. They had been told not to think but to follow orders."

Mr. Porter entered the Westinghouse Electric & Mfg. Company's works as industrial engineer. Westinghouse to be an autocrat. At that time 10,000 employees were hired and quit each year. A school had been developed which for a time roused great interest in the employees. They saw a chance to rise; but the chance never came. Heads of departments were engaged from outside. They came, is the employees expressed it, through the roof, and they landed on the bayonets of those below. Big men ame and went because of the employees' resentment. The employees were also waiting for the big man make a big mistake and when it occurred they all

oined in 'whooping it up'.'

Works Legislature for Shop Conditions After succeeding in the publicity department, Mr.

Westinghouse sent Mr. Porter to his lamp works, a pet scheme of Mr. Westinghouse which was losing \$10,000 a month. Here he found that Mr. Westinghouse had given jobs to all down-and-out friends. Beginning at the top with these friends, the plant was inefficient to the tramp workmen below. Mr. Porter had been given complete authority in handling this plant, and he began by ousting the immoral executives. He instituted a legislative system, including an upper house, consisting of foremen and superintendents, and a lower house, or committee, of workers. Questions of wages, hours and shop conditions were relegated to this body. A suggestion box yielded valuable ideas for the develop-ment of the plant. The minutes of the legislature were printed. Publicity opened up the management. result immorality disappeared, the undesired employees and managers dropped out, the plant was made safe for women employees and in eighteen months it was sold to the Westinghouse Company for \$2,000,000. There it disintegrated within a year.

Mr. Porter told of a Philadelphia machine shop and foundry which had become a successful institution through industrial democracy. The original building was a pier-shed transported to the Philadelphia suburb. The only light which reached the plant came through holes which had been made in the sides of the building. All the machines were second-hand. The shop was poorly planned and most of the workers were drunk. When he took charge the manager handed him a petition from the employees for a half holiday on Satur-The manager did not know what to do with it, but pointed out that the shop was losing money every day and that if a half holiday were given the loss would

be increased.

Mr. Porter asked to have the workers called together, and a soap box was placed in the center of the room. A bell was sounded and the workers gathered around. Mr. Porter waited for the manager to introduce him, and when the latter made no move he asked that he be presented to the workers. The manager said he didn't know how, since he had never spoken to them before, so Mr. Porter was obliged to introduce himself. He told them that they were going to have a vote on questions regarding the policy of the plant. A congress would be elected which would consider as its first bill the question of a half holiday on Saturday. He told the employees that he realized they were wondering what was to be "put over on them" next, and assured them that he concealed nothing, and really meant all that he said. A complete system of democracy was introduced. The employees decided on hours of work, wages, foremen of the foundry, etc. As a result accidents decreased and the feeling of co-operation made the plant an industrial success.

In the discussion following, Mr. Porter added that suggestions came to the committee from the management through the same process as from the individual employee. In response to requests, he told the result of the demand for a half holiday on Saturday.

congress voted to try it for six weeks, and if production had not increased in that time to revert to the previous arrangement. It proved such a valuable innovation, as measured by increased output alone, that a half day off Saturday became a regular practice. He overcame irregularity and tardiness in attendance by offering bonuses for coming early and working regularly, instead of docking for lateness. Charles B. Scott, general manager, bureau of safety, Commonwealth Edison Company, Chicago, approved Mr. Porter's suggestions and said the efficiency manager was an administrator of the worker's suggestions. From 400 men in one plant, he said, he had received 269 suggestions, of which 249 proved valuable.

#### Putting Cripples on the Pay Roll.

Frank B. Gilbreth, consulting engineer, Providence, R. I., spoke on "Putting Cripples on the Pay Roll." Mr. Gilbreth spoke with particular reference to the soldiers who were being crippled in the war, but hoped the suggestions would be adopted in this country for those who were crippled in industrial pursuits. He pointed out that there are more yearly cripples in Canada as a result of industrial accidents than are returned by the war.

In Europe, he said, the machine is worshiped to such an extent that it remains unchanged and the man is fit to it. Artificial arms are attached to the stub before the wound is healed, and the fingers of the artificial arm attached to the living muscles. In America they are endeavoring to fit the machine to the man.

The first experiment in this country has been made on the typewriter; other experiments in other lines of work, Mr. Gilbreth said, were sure to follow, but it was

logical to work with the typewriter first.

Joseph H. Willits, secretary Philadelphia Association for the Discussion of Employment Problems, said the employment managers' associations were formed for employers who were not too busy spending their time in fighting the unions. He thought the industrial quarrel was largely the result of employers failing to take into consideration the human element of their plant. By studying carefully one at a time the questions entering into the dispute between the employers and employees, he hoped they would be able to meet on the common ground of co-operation in production.

#### Suspicion Over Government Health Investigations

The work of the health department in relation to the human element in business was described by Dr. Louis I. Harris, chief of the Division of Industrial Hygiene, New York. Governmental investigations have become too much of an autopsy, Dr. Harris claimed. They are like a coroner's statement after the harm has occurred. We must prevent industrial mishaps, not investigate their causes after they have happened. A clearing house is required for tests of the comfort and happiness of employees. The Government is willing to help, but the business man has been very suspicious of The doctor must be given an opportunity its motive. to go into the industrial plant and to study such questions as personal hygiene, fatigue and shop conditions, such as light, ventilation, heat, sanitation, rest and wash accommodations, and provisions for lunching. labor union has already responded. The Central Federated Union indorses the hygiene work of the Department of Health, and is forming a committee to tell the Government what it feels is owing to them.

#### An Employee Valuation Plan

Herbert N. Fell spoke on his plan of insurance to stabilize employment, outlined in The Iron Age of Dec. 7. To alleviate the possibility of an employee's being required to leave a job because of a personal disagreement with a foreman, he urged the introduction of an employee valuation plan. This plan would set a total value on the personnel of each department and would require the foremen to make individual valuations. The foreman's opinion would be checked by the efficiency of each worker as shown by his production. When a good man leaves a department it reflects on the foreman. He is asked the reason for the loss. If a number of good men leave the fault is evidently with the foreman,

whereas if most of the employees who drop out are of little value, it will show that the foreman is improving

his department

Mr. Fell offers his insurance plan as a means of increasing the interest of the employee and of holding him to one plant. He claims that the common systems of insurance and bonuses are wrong because they can be rescinded by a vote of the management. He compared the methods in vogue to a wealthy man who tells an employee that he has set a certain sum aside for him in his will. After receiving the service of this employee, which is more efficient because of the monetary encouragement held over him, he suddenly revokes the will. Mr. Fell believes that the proper method of saving is to set aside the sum at the source, as in the case of the income tax.

As representative of the Chamber of Commerce of the United States, Allen Walker read a paper on "Educating the Unit." The two great problems of modern business, he said, were cut-throat competition and labor troubles. He decried the practice of some employers of picketing rival plants and offering better inducement to the employees. Too many employers, he said, can sympathize with an individual workman, but fail to think of the unit when part of a group. In their methods of dealing with employees they proceed with-This plan usually results in paternalism, out data. which is disagreeable to the employees.

#### Selecting Employees by Their Photographs

Harrington Emerson, an industrial management engineer, spoke on "Preliminary Selection by Photographic Analysis." He illustrated the value of photographs as an index to character by throwing on the screen pictures of prominent men and describing their character as delineated by an expert. Pictures of Henry Ford, Huerta, Hindenberg, von Zeppelin, Miss Cavell, and others, and composite photographs of the rulers of the Central Powers and of the Entente, illustrated the system of facial study. He told of using a restrictive advertisement for an employee and of elim nating 340 out of the 360 applicants by the photographic method. Half of the remainder was eliminated by reference, and the final ten could easily be interviewed. Mr. Emerson offered this as one of many methods of selecting employees.

#### Employers' Attitude Toward Compensation

Harry A. Mackey, chairman of the Pennsylvania Workmen's Compensation Bureau, in a statement Feb. 1 paid a high compliment to employers throughout Pennsylvania for their part in making the operation of the State's compensation law effective. He said:

"I find that our employers are thinking in advance of the period. The greatest corporations of the State are dealing with their employees more liberally than the law demands. Complaints of discrimination against crippled or physically weak employees have come to our board for investigation, and nine-tenths of the complaints were without the slightest foundation. We are daily in receipt of requests from employers asking us to assist them to induce employees to receive proper medical or surgical treatment in order to guarantee their future activity. I attribute this to the fact that our board has thoroughly shown that it will not allow this law to become revolutionary, so that there will be no taking of property without due process of law. It is not an insurance scheme by which every injured man is entitled to recover something, except as established by the usual and well-known rules of evidence. The usual presumptions known to the law must never be disregarded nor reversed in the administration of a workmen's compensation law."

A college course on the human side of engineering has been outlined by the industrial department of the International Committee of Young Men's Christian Associations, 124 East Twenty-eighth Street, New York. A copy of the outline together with a list of reference books may be obtained by applying to F. H. Rindge, Jr., at the foregoing address.

# Fortifications Bill Interests Steel Trade

Amount Appropriated Far Exceeds Any Previous Year—Heavy Purchases Proposed of Cannon, Munitions and Munitions-Making Machinery

Washington, D. C., Feb. 8, 1917.—Appropriations exceeding by 100 per cent the unprecedented figures of last year and by 700 per cent the annual average of the 10 years preceding 1915 are carried in the annual fortifications bill, which has been reported to the House by the Committee on Appropriations. The aggregate is \$51,396,593, as compared with \$25,747,550 provided by the last fortifications act, and an average of about \$6,000,000 per annum for the preceding decade. Numerous provisions in the bill contemplate purchases of material from private manufacturers, which are designed to encourage them to keep their plants in a state of efficiency with a view to meeting any emergency that may arise, and a section has been incorporated discriminating in favor of American-made material except in extreme cases.

#### **Fortifications Armament**

For the specific purpose of providing fortifications armament, the bill carries \$37,653,000, of which nearly one-third may be expended in the purchase of material from private manufacturers. For the purchase and manufacture of mountain, field and siege cannon and the machinery necessary for their production at the arsenals the bill carries \$6,900,000, with the proviso that the Chief of Ordnance may enter into contracts with private manufacturers not exceeding \$2,200,000. For the purchase and manufacture of ammunition for such cannon the sum of \$7,310,000 is provided, of which \$2,000,000 may be used for the purchase of ammunition by contract. For the purchase and manufacture of seacoast cannon for coast defense, including machinery for their production, the bill appropriates \$9,231,000 and the Chief of Ordnance is authorized to make contracts with private manufacturers not exceeding \$2,200,000. Ammunition for seacoast cannon is the largest single item carried under the general head of fortifications and for these purposes \$10,940,000 is provided with the stipulation that \$2,000,000 may be expended under contracts which include not only the production of new ammunition but the modernizing of considerable quantities of projectiles now on hand as well as machinery necessary for the manufacture of up-to-date ammu-

Other items included in this section of the bill, the appropriations for which may be used either for the manufacture of the material in Government establishments or its purchase from private manufacturers in the discretion of the Secretary of War, are as follows: Ammunition, subcaliber guns and other accessories for seacoast artillery practice, including the machinery necessary for their manufacture at the arsenals, \$572,000; for alteration and maintenance of the mobile artillery, including the machinery necessary, \$1,000,000; ammunition, subcaliber guns and other accessories for mountain, field and siege artillery practice, including the machinery necessary, \$1,000,000; alterations and maintenance of seacoast artillery, including machinery, \$700,000

#### American Products Get Preference

Discrimination in favor of American products is authorized as follows:

All material purchased under the provisions of this act shall be of American manufacture, except in cases when, in the judgment of the Secretary of War, it is to the manifest interest of the United States to make purchases in limited quantities abroad, which material shall be admitted free of duty.

Notwithstanding the enormous increase in the cost of producing powder and the unprecedented demand of foreign countries, the bill re-enacts the provision in the existing law to the effect that no expenditure for any

powder other than that used for small arms shall be made at a price in excess of 53c. per lb.

To protect the Government against unreasonable prices and at the same time to enable the Department to use full discretion in case of an emergency, the bill contains the following provision:

Except as expressly otherwise authorized herein, no part of the sums appropriated by this act shall be expended in the purchase from private manufacturers of any material at a price in excess of 25 per cent more than the cost of manufacturing such material by the Government, or, where such material is not or has not been manufactured by the Government, at a price in excess of 25 per cent more than the estimated cost of manufacture by the Government: Provided, however, That whenever in the opinion of the President an emergency exists affecting the general welfare of the United States, he may waive the limitations contained in this section.

#### Government Shop Management

The movement in Congress having for its object legislation requiring the arsenals to be run to the limit of their capacity with a view to curtailing as much as possible purchases from private manufacturers failed completely so far as this bill is concerned, which provides merely that "expenditures for carrying out the provisions of this act shall not be made in such manner as to prevent the operation of the Government arsenals at their most economical rate of production except when a special exigency requires the operation of a portion of the arsenal's equipment at a different rate." This leaves the matter within the discretion of the Chief of Ordnance, who is known to be opposed to operating the arsenals more than one shift under ordinary circumstances, and who regards a three-shift system as uneconomical and, in the present condition of the skilled labor market, impracticable if not impossible.

The prohibition of scientific shop management which was enacted in last year's measure is carried in this bill in the following terms:

No part of the appropriations made in this act shall be available for the salary or pay of any officer, manager, superintendent, foreman, or other person having charge of the work of any employee of the United States Government while making or causing to be made with a stop watch or other time-measuring device a time study of any job of any such employee between the starting and completion thereof, or of the movements of any such employee while engaged upon such work; nor shall any part of the appropriations made in this act be available to pay any premium or bonus or cash reward to any employee in addition to his regular wages, except for suggestions resulting in improvements or economy in the operation of any Government plant.

#### High Cost of Work in Government Shops

It is understood that the effect of this prohibition in the past year has been to increase enormously the cost of producing material in the arsenals and to reduce the output of the employees per capita to an astonishing degree. All the gains made in productivity and cost reduction under the Taylor system have been lest. Detailed reports prepared with great care by experienced supervising officers show that the cost of the war material thus produced has risen approximately 100 per cent as the result of the abandonment of scientific shop management systems. In addition, there has been an important increase in the wage basis at the arsenals to keep pace with that prevailing in the vicinity and the total of these two additions to the cost of production has resulted in placing on the shoulders of the taxpayers an enormous burden which must now be still further increased to provide unprecedented quantities of material to meet the emergency precipitated by the rupture of diplomatic relations with Germany.

# Record Year of Iron and Steel Exports

Value of Shipments for 12 Months 123 Per Cent More Than 1915 Although December Figures Show Declines from High Levels

Washington, D. C., Feb. 6, 1917.—A new banner year in the exports of iron and steel, with enormous totals, far exceeding any previous calendar or fiscal twelvemonth, was recorded in 1916, according to official statistics of the Bureau of Foreign and Domestic Commerce. The value of these shipments for the year just ended exceeded by 123 per cent the total of 1915, which, in turn, surpassed the largest previous total by more than 32 per cent. Exports of tonnage commodities

pared with \$388,703,720 for the year 1915 and \$233, 934,160 in 1913.

#### **Exports of Machinery**

Exports of machinery in December were valued at \$21,099,087 as compared with \$13,228,450 for the same month of 1915. The high record for shipments of machinery is still held by August, 1916, with a total of \$24,657,597. Exports of machinery of all kinds for

Exports of Me	achinery			
	——Dece	ember——	Calend	lar Year—
	1915	1916	1915	1916
Adding machines	\$58,885	\$163,414	\$554.381	\$1,428.131
Air-compressing machinery	59.366	110,573	503.643	883.827
Brewers' machinery	1.387	1.389	60,427	14,915
Cash registers	81.881	135,698	1.273.871	1,629,677
Parts of	6.442	7,500	101.971	137.705
	4.143	13.068	54.881	
Cotton gins	51.868	12,529	318.491	99,650
Cream separators	85.463	150.109	1.080.803	416,054
Elevators and elevator machinery				1,801,319
Electric locomotives	21,609	81,645	228,479	615,821
Gas engines, stationary	12,855	50,334	453,329	406,297
Gasoline engines	800,876	1,060,398	6,805,357	14,323,036
Steam engines	539,791	1,056,948	10,463,378	11,412,452
All other engines	101,744	168,054	1,051,738	4,844,731
Parts of	486,794	2,222,978	4,791,498	13,672,861
Laundry machinery, power	26,784	27,008	303,914	300,180
All other	28.417	30,368	262,710	283,765
Lawn mowers	14.576	9.750	282,175	215,837
Metal-working machinery (including metal-working tools)	3,205,788	6,506,205	42,037,779	79,698,861
Meters, gas and water	20,902	35.309	246.617	364,050
Milling machinery (flour and grist)	320,963	67,126	2,403,580	2.043,765
Mining machinery, oil well	61,913	165,128	1,220,009	1,980,319
All other	481,363	649,262	5.718.134	7.248,172
Paper-mill machinery	97,487	254,361	908.947	1,285,500
	124.563	233,874	1.435.037	1.987.092
Printing presses	363,541	487.331	3.463.421	5.634.297
Pumps and pumping machinery				
Refrigerating and ice-making machinery	66,221	56,853	802,542	677,196
Sewing machines	454,954	597.684	5,707,880	5,607,445
Shoe machinery	96,843	150,775	1,451,462	1.107,851
Sugar-mill machinery	958,399	1,413,046	5,363,160	9,058,347
Textile machinery	181,876	329,725	1,882,520	3,542,036
Typesetting machines	62,278	107,782	478,555	1,141,778
Typewriting machines	731,513	903,520	7,254,893	10,845,064
Windmills	61,233	61.562	894,122	999,059
Wood-working machinery, sawmill	24.998	41,420	339.413	458,160
All other	69.287	54.532	1.026.444	884,410
All other machinery and parts of	2,503,048	3.699.829	23.948,301	39,411,964
The state of the s				
Total	13,228,450	\$21,099,087	\$134,128,862	\$226,461,624

gained 74 per cent over 1915; shipments of machinery rose 70 per cent and exports of machine tools exceeded the figures of 1915 by more than 90 per cent.

While the exports of iron and steel for December showed a slight decline amounting to 4 per cent as compared with the record total of May, 1916, they displayed a marked upward tendency as compared with recent months and exceeded by nearly 100 per cent the shipments in December, 1915. Exports of tonnage com-modities in December also showed a small shrinkage of 5 per cent as compared with the high total of October, 1916, but an advance of 65 per cent over December, 1915. The recent downward tendency in shipments of machinery was accentuated in December, which showed a loss of 14 per cent as compared with August, 1916, but a gain of no less than 68 per cent as compared with December, 1915. The shrinkage in machinery especially marked in the exports of metal-working tools in December, which dropped 35 per cent from the record total of May, 1916, although scoring a gain of 103 per cent over December, 1915. The exports of December, 1916, both in value of total exports and quantity of tonnage commodities, would probably have exceeded all previous monthly records but for the fact that the month included six holidays and two official half-holidays

The value of all iron and steel products exported in December, 1916, was \$88,536,958 as compared with \$45,825,277 for the same month of 1915 and \$14,939,613 for December, 1914. Maximum exports were recorded in September, 1916, aggregating \$90,895,592. For the calendar year, 1916, the total was \$867,323,044 as com-

the calendar year, 1916, were valued at \$226,461,624, as compared with \$134,128,862 in 1915. Shipments of metal-working machinery in December aggregated

Expo	ts of Ire	on and Ste	eel	
	-Dece	mber-	-Calend	ar Year-
	1915.	1916.	1915.	1916.
	Gross	Gross	Gross	Gross
	Tons	Tons	Tons	Tons
Dig iron			224.499	612.241
Pig iron	21,807	105,195		212,765
Scrap	16,276	14,860	79,361	74,108
Bar iron	3,975	6,364	39,727	450 171
Wire rods	13,459	13,415	165,013	158,171
Steel bars	49,607	63,289	403,577	773,997
Billets, ingots and				
blooms, n.e.s	49.912	162,901	560,728	1,508,727
Bolts and nuts	2.500	2,231	23,484	29,225
Hoops and bands	3,006	3,038	29,326	44,001
Horseshoes	544	145	15,862	7,819
Cut nails	248	222	4,216	4,761
Railroad spikes	2,629	1,391	13,297	23,852
Wire poils				150,171
Wire nails	8,488	11,012	91,632	Ynolyn
All other nails, includ-			0.010	12,393
ing tacks	1,083	1,303	9,249	Yeiner
Cast-iron pipes and fit-				70,223
tings	4,778	5,765	46,963	10,000
Wrought pipes and fit-				158,349
tings	18,366	14,157	129,960	100,000
Radiators and cast-				
iron house heating				0.100
boilers	337	197	2,288	2,423
Steel rails	41,102	41,125	391,762	540,349
Galvanized iron sheets	,			
and plates	3.949	7,736	75.938	84,303
All other iron sheets	0,010	1,100		
and plates	2,584	3.816	25,548	46,403
Steel plates	17,907	25,999	222,473	275,984
Steel plates	7.373		97.464	108,167
Steel sheets	1,010	12,639	81,202	8444
Structural iron and	50.000	05.010	929 927	301,649
steel	18.920	35,648	232,937	227,348
Tin and terne plates	16,972	18,229	154,561	418,883
Barb wire	26,176	15,820	248,620	268,519
All other wire	22,111	14,484	224,968	200,011
FD - 4 - 3	201100	200.000	0 519 /59	6,102,104
Total	354,109	580,961	3,513,458	0,000
8				

\$6,506,205 as compared with \$3,205,788 for the same month of 1915. The record shipment of metal-working machinery was made in May, 1916, when the total was \$9,935,806. Shipments of machine tools for the calendar year aggregated \$79,698,861 as compared with \$42,037,779 in 1915. Details of the exports of machinery for December, 1915 and 1916, and for the two calendar years are given in an accompanying table.

#### Exports of Iron and Steel

The exports of iron and steel for which quantities are given aggregated 580,961 gross tons in December, 1916, as compared with 354,109 tons in the same month of 1915. Maximum exports of tonnage.commodities were recorded in September of this year, when the total was 642,763 gross tons. For the calendar year 1916, shipments aggregated 6,102,104 gross tons as compared with 3,513,453 tons for the same period of 1915. An accompanying table shows the exports for December and for the calendar year 1916 as compared with the same periods of 1915.

#### Imports of Iron and Steel

The imports of tonnage iron and steel in December made a substantial gain not only over the figures for the same month in 1915 but over the total of November. The aggregate receipts in December were 44,142 tons as compared with 35,455 tons in the same month of

Imports of				
	Dec	ember	Calend	lar Year
	1915, Gross Tons	1916. Gross Tons	1915, Gross Tons	1916, Gross Tons
Ferromanganese Ferrosilicon All other pig iron. Scrap Bar iron Structural iron and steel	331 11,289 20,666 284 79	4,531 292 3,353 31,424 277 261	5,226 84,610 79,982 8,520 1,509	*90,928 6,739 37,682 116,039 7,701 1,473
Hoop or band iron. Steel billets without alloys. All other steel billets Steel rails Sheets and plates Tin and terne plates Wire rods	1 865 1,280 113 61 471	1,242 1,309 522 244 34 653	1,412 10,586 78,525 1,421 1,341 5,316	10,255 15,588 26,299 1,735 1,019 4,131
Total	35,455	44,142	281,449	•319,589

\*These figures, it is believed, are erroneous, as the December imports, added to the total for the prvious 11 months, make the year's imports 77,966 tons.—Editor.

1915 and 42,543 tons in November, 1916. Scrap, which constituted nearly 60 per cent of the imports of November, composed more than 71 per cent in December. The imports for the calendar year 1916 were 319,589 gross tons as compared with 281,449 tons in 1915. An accompanying table shows the imports of tonnage commodities for December, 1916, and for the calendar year as compared with corresponding periods of 1915.

W. L. C.

#### Iron-Ore Exports Large, with Imports Below Normal

Despite the enormous demand for iron ore in this country, the exports for the 11 months to Dec. 1, 1916, exceeded previous recent records. To Dec. 1, 1916, they were 1,174,402 gross tons, as compared with 696,477 tons to Dec. 1, 1915, and 550,392 tons to Dec. 1, 1914, and greater than the total for 1913 of 1,042,151 tons. The 1916 exports probably exceeded 1,275,000 tons. Canada received the bulk of this.

Iron-ore imports are at about the rate of the last two years. For the 11 months to Dec. 1, 1916, they were 1,207,693 tons, with the average for September, October and November at 95,945 tons per month. This is only about one-half the normal movement, the total in 1913 having been 2,594,770 tons. Of the 1,207,693 tons to Dec. 1, 1916, Spain furnished 143,470 tons, Sweden 193,-352 tons, Canada 136,835 tons and Cuba 635,191 tons.

The manufacture of agricultural machinery and implements has now been put under control by the Ministry of Munitions of Great Britain as machinery to be dassed as munitions work. There were 4623 establishments under Government control at the first of the year.

#### Book Reviews

Mediation, Investigation and Arbitration in Industrial Disputes. By George C. Barnett, professor of statistics, Johns Hopkins University, and David A. McCabe, assistant professor of economics, Princeton University. Pages, 209; 5 x 7% in. Published by Appleton & Co., New York. Price \$1.25.

The authors present in this volume data submitted to the Commission on Industrial Relations in 1915 and additional material bringing it up to date, together with appendices quoting extracts from the Commission's final report. The book is a compilation and exposition of the duties and problems of mediation in industrial disputes.

To offer an intensive study, only Massachusetts, New York and Ohio are taken into consideration, since they combine all the arrangements represented in other States which have made legal provision for agencies of mediation, public investigation and arbitration, and in addition they possess diversified groups of industries.

Of these three kinds of public methods the best results, the authors say, have been obtained through mediation. State agencies of arbitration are rarely used and public investigation has been used sparingly. The authors believe that these agencies when properly constituted will prove of great service in presenting or shortening strikes and lock-outs.

In national disputes the authors suggest the establishment of one agency to act in four large fields; namely, railroads; other interstate commerce; employees and employers in two or more states; and disputes in which the President of the United States has been called upon to protect life and property. The first alone comes under the existing Newlands Act. The Secretary of Labor has been empowered to mediate but lacks funds for the purpose. Uniform and authoritative legislation, the book asserts, is needed in this field.

Franco-American Trade. Report by the American Industrial Commission to France to the American Manufacturers' Export Associations. Pages 256, 8 x 11 in.; numerous illustrations and colored maps. Published by the American Manufacturers' Export Association, 160 Broadway, New York.

To those somewhat skeptical of a big demand being made on the industries of the United States to help rehabilitate the devastated sections of Europe, the recent Foreign Trade Council meeting in Pittsburgh must have been illuminating, to say the least, and now comes the report of the commission which visited France under the auspices of the American Manufacturers Export Association last September and October and at the behest of certain French authorities. The report makes a very good case of the great needs which will require combined efforts of other nations as well as our own to supply. All through the report, however, there is emphasis on the desirability of developing reciprocal relations, to buy from France the things we need as well as to supply the things which France must have. The most far-reaching co-operation of American industries is desired, the report says, "and it is earnestly hoped that special consideration will be shown by America, both as to price and terms." The report also freely admits the necessity of tariff adjustments on both sides.

The description of the tour through France brings out the existence of what is known as the "Central Association for the Resumption of Industry in the Invaded Districts"; that a committee of the French senate is studying questions which affect the future economic life of France at home and abroad; that France is now manufacturing chemical wares formerly imported and that a group of distinguished Belgians are firm in the belief of an early necessity for stocks of machinery and raw material to be stored for use when peace is declared, expecting that credit will be extended for the undertaking on a basis "of the moral security of past

honesty and a sane commercial instinct still assured

of a quick recuperation."

It is emphasized that we must prepare to grant the same terms abroad that we do at home. French mercantile agencies are now being organized and will attempt to give credit ratings on a similar basis to ours. French banks are likely to impart information required, but the hope is expressed that American banks will extend branches throughout Europe. report intimates that some of the proposals of the economic conference of the Allies in Paris are hardly likely to be adopted in full, but that we may suffer under "favored nation" considerations just as now American manufactured products are assessed considerably more than similar articles imported from other countries.

In discussing industry and plant construction it is clear that the commission believes that France has learned the economy of abandoning poorly located plants and of scrapping antiquated machinery and that its new war plants are models. The report lists some of the materials and equipment in most immediate need, and says that the hope was often expressed that American capital would co-operate with French interests and erect new plants in France. One interesting development is the apparent intention to manufacture articles on a large scale rather than having large plants devoted to a great variety of products or less special according to the whims of the buyer. Out of this labor-saving devices and improved machinery will be required.

Chapters are devoted to labor, to industrial machinery, to a discussion of employer and employee organizations, to agricultural machinery, to seaports and shipping, to transportation, to hydroelectric power, In discussing mining and metallurgy some reference is made to the gigantic efforts to capture Verdun as inspired possibly by the desire to secure a firm hold on these iron ore regions, as has been emphasized in these columns in articles by H. H. Campbell. The report places some emphasis on the iron mines of the French colony of Algiers, an ore reported low in phosphorus, and it is suggested that such ore might well be returned in vessels carrying coal from this country

to Mediterranean ports. The commission included W. W. Nichols, Allis Chalmers Mfg. Company, chairman; J. G. Butler, Jr., vice-president Brier Hill Steel Company, Youngstown, Ohio, whose special report was given some time ago in these columns; A. B. Farquhar, president A. B. Farquhar Company, York, Pa., and N. F. Hoggson, president Hoggson Brothers, New York, builders, who was editor of the report.

Fatigue Study .- By Frank B. Gilbreth and Lillian M. Gilbreth. Pages 159, 43/4 x 13/4 in.; numerous illustrations. Published by Sturgis & Walton Company, New York. Price \$1.50.

This edition may be considered a sequel to "Motion Study," by the same authors. It is a textbook on fatigue investigation, designed to influence further investigations in this field to increase the efficiency and "happiness minutes" of the workers.

cientific investigation of fatigue requires the special training of an expert, and laboratory methods and But there are also preliminary methods for the study and elimination of fatigue which should be brought to the attention of the amateur in order to utilize immediately the incentive which might be lost if buried in physiological and psychological studies. The authors describe these elementary methods, as well as the scientific system toward which they are a step.

In calling attention to the detrimental part which fatigue plays in industries, the authors point out that the workers have long recognized the need for fatigue elimination and that the employers are just coming to a realization of the large price they have been paying for it. A firm which is being organized on scientific lines should make a fatigue survey as the first step. If not conducted by an expert, the survey should be made by the manager or a member of the organization, for only direct contact with conditions and a realization of what the experiments expose will enlist the zeal of the owner.

Chapter 5 deals with the preliminary elimination of fatigue by improvement in lighting, heating and ventilation and fire and safety protection. Immediate iner. pensive changes are suggested in regard to improving work places, tables and chairs and the rearranging of materials and tools and care of the worker's cloth-Scientific fatigue measurements and elimination are dwelt upon in chapter 7. The methods are given as motion study, micromotion study, the cyclegraph, the chronocyclegraph and the penetrating screen. Thirty-three photographs of experiments made at the New England Butt Company illustrate the methods and implements used.

### Will America Wake Up?

In a thoughtful article by John A. Topping, chairman Republic Iron & Steel Company, published by the International News Service, a lesson in the work necessary to secure the utilization of our national powers and resources is drawn from the experience of Great Britain and other belligerent countries. Mr.

Topping says, in part:

To emphasize the contrasting principles of governmental policy employed at home and abroad, it may be said that we enforce, under anti-trust laws, waste ful and destructive competition, while our principal rival nations legalize pools and syndicates, and even governmental participation in the management of industry is given when necessary to conserve national resources or promote national welfare. The objection may be raised that European co-operation is socialistic. But this objection is sentimental, if, by the application of the principle of co-operation, we can advance the spiritual and material well-being of our country, such a change in policy being only the natural evolution suggested by experience, rather than a revolution, for many of our political traditions born of other conditions should be cast aside.

"A member of our Federal Trade Commission stated recently that what business needs is constructive statesmanship. Business, in my opinion, is not as short of constructive statesmanship as are some other fields of activity, not the least of which is the field of government. Through the creation, however, of various governmental commissions, such as the Federal Trade, Tariff, Reserve Board, Shipping Commission and possibly others, it may be said that we have all the machinery necessary for doing business, along co-operative lines, but unless a broader gov ernmental co-operative spirit is manifested than that evidenced by the present administrative policy of creating government competition, by the production of commodities heretofore properly belonging to private enterprise exclusively, and furthermore, unless we remove the antagonistic influence of discriminatory tax and revenue laws, which now place the burden of maintaining the government expenses on the few, to the exclusion of many, I am of the opinion that the growth of patriotism will be retarded, for no real interest can be created in government or anything else unless all participate in its support.

"On the other hand, if the co-operative power of the press is properly used to emphasize our responsibilities, not only as a government but as a people and all forces work with a unity of purpose on a broad basis of co-operation, the results, in my opinion, wil exceed our most optimistic expectations. As the Hon-Charles E. Hughes very aptly states the proposition:
We have got the basis of success. What we need now is the motive power of unswerving loyalty and a real conscious power of unswerving loyalty and a real conscious power of unswerving loyalty and a real conscious power of the succession of the succ consciousness of national unity which will fill us with a dominant sense of patriotic loyalty to the United States.' Under this consol through the states of States.' Under this general thought our slogal would be Patriotism, Preparedness, Prosperity

Peace."

To provide better office accommodations for superil tendents and others the Alan Wood Iron & Steel Company is erecting an office building near its steel plant at Ivy Rock, Pa.

## EXPORT RATE DECISION

### Interstate Commission Denies Permission to Advance Freight Rates on Exports

Washington, Feb. 6, 1917.—The Interstate Commerce Commission has refused to sanction the proposed cancellation of (or increases in) export rates on iron and steel from points in Central Freight Association and Trunk Line territories to Atlantic ports and from points in Central Freight Association territory to Gulf ports, but has authorized the application of present domestic rates on export traffic from Pittsburgh to the Atlantic seabord, provided that Chicago, Cincinnati and other points in Central Freight Association territory are given rates to the seaboard properly adjusted with reference thereto. The schedules attacked by complainants in this case will be held under suspension until new tariffs are filed in accordance with this decision.

The carriers, by schedules filed to become effective Oct. 1 and Nov. 1, 1916, proposed to cancel their export commodity rates on pig iron, billets, and manufactured iron and steel articles from producing points in Central Freight Association and Trunk Line territories to the Atlantic ports and to apply their domestic rates instead. The export rates are about 66 2/3 per cent. of the domestic rates. The export rates from Cincinnati, St. Paul, Chicago, St. Louis and several other points in the Central West to the Gulf ports were also proposed to be canceled or increased, effective Oct. 1. These rates, however, are fixed by the rates to the Atlantic seaboard. Since they are made to equalize the Gulf ports with the seaboard, as a practical matter they must stand or fall with the rates to the seaboard. The first suspension of the schedules expired Jan. 29, 1917.

#### History of Export Rates by the Commission

Until late in 1903 such export traffic as there was in iron and steel moved to the seaboard at domestic rates. Depressed business conditions about that time led 13 of the largest manufacturers to petition the carriers for a reduction of at least 50 per cent in the rates to assist them in developing their foreign trade and to enable them to distribute their overhead charges over a larger total output. Such lower rates were represented to be necessary because of the fact that producers in England, France, Germany and Belgium, with cheaper labor than could be had in this country, were then in control of the foreign markets in which the American industries desired to compete. The carriers refused to establish rates on the basis asked, but promptly provided rates one-third less than their domestic rates. The commission says:

The maintenance of export rates on iron and steel is admitted now to be a settled policy, but it is not intended as one in be adhered to during the existence of unusual conditions. The reasons given by the carriers for the proposed cancellation of their export rates is the cessation of the conditions which gave rise to their establishment. The countries from which the competition came are now at war, and the producers therein, although still exporting to some extent to South America and the Orient, are said to be confining themselves mainly to contracts for their own governments.

The prices of iron and steel have materially increased in recent years and since the outbreak of the war the export basiness in iron and steel has grown by leaps and bounds. The carriers, having ia mind the enormous quantities of war material that are now moving, feel that the continued maintenance of the present export rates means a serious loss of sevenue that they are justly entitled to receive and which they think they are entitled to enjoy without detriment to the shippers. Carriers regard the domestic rates as reasonable, and are of opinion that the export traffic will move as freely in the domestic rates as on the export rates as long as present conditions continue. The increased ocean rates do not appear to have retarded the movement in the least.

## Railroads Have Not Justified Their Action

While the shippers would, of course, prefer to see the export rates continued, the commission finds there is no great objection to the application of domestic rates during the existence of present conditions. What opposition there is seems to be due in some measure to the fear that the shippers may experience some difficulty in having the export rates restored when, imme-

diately upon the cessation of hostilities, the foreign competition will probably make itself manifest.

In view of all the facts in the case the commission holds:

The carriers have not justified, as a whole, the proposed cancellation of their export rates to the seaboard and the substitution of their domestic rates instead, but the rates from Pittsburgh and the related points may be allowed to go into effect, provided rates for export traffic are published from Chicago which are related to the Pittsburgh rates as 100 is to 60, and from Cincinnati which are related to the Pittsburgh rates as 87 is to 60. Similar adjustment should be made with respect to other producing points west of Pittsburgh which are not given rates based on differentials over Pittsburgh. Such rates may be made effective upon five days' notice to the commission. Respondents will be expected to call our attention to the new tariffs when filed, whereupon the orders of suspension will be vacated in case the new tariffs conform to the requirements here laid down.

Regarding the pendency of the Pollak Steel Company case, which puts directly in issue the relationship that exists in the domestic rates to Eastern cities and also challenges the reasonableness of the domestic rates from certain points, the commission says that "should any change therein be found proper in the Pollak Steel Company case the changed rates, so far as we can now see, would apply also to export rates and in any event no reason occurs to us why the export rates suggested herein may not, if they have been established, be canceled simultaneously with any readjustment that may be made in the domestic rates as a result of our decision in that case."

#### To Build Ocean-Going Ships in Indiana

The Howard Shipyards Company has been incorporated with a capital stock of \$4,000,000 to take over a number of shipyards in Jeffersonville and Madison, Ind.; Cincinnati, Ohio; Paducah, Ky., and Mound City, Ill. It is planned to expend \$1,000,000 in improving the Jeffersonville plant to fit it for the construction of ocean-going freight steamships having a maximum capacity of 4000 tons. The plant will employ 1000 men, and about three years will be required to complete all of the proposed work.

The Jeffersonville plant was established in 1834 by James Howard and has been operated continuously ever since except for a short period during the Civil War. A number of ocean-going craft have been built there, as well as barges for carrying freight to Cuba and steamers for the rivers of Central and South America. It is said that the first steamboats to navigate the Yukon were launched there.

The vessels will be completely built and equipped at Jeffersonville, except for the masts and the stacks, which will be installed at the Mound City plant on account of the bridges across the Ohio. Two standard types of vessels, one of 3000 tons drawing 6 ft. of water without coal or ballast and a 4000-ton vessel drawing 4 in. more, will be built. The other four plants will be used to take care of the river business for the present, which it is expected will be greatly developed.

Charles G. Brazier, New York, is president of the new corporation. The Howard interest will be represented in the company and will give special attention to the Jeffersonville plant.

Automobile manufacturers in Detroit are not only finding production seriously interfered with by inability to secure material because of railroad embargoes, but are greatly inconvenienced by lack of cars for shipping their product. It is stated that practically every vacant building in the city that can be secured for the purpose has been taken for the storage of automobiles awaiting shipment and that this storage space is now about filled.

The first heat in the new electric furnace of the Carpenter Steel Works, Reading, Pa., was run off Jan. 31. This furnace is in a new building, which is of steel and concrete construction throughout, and represents the latest expansion of the company. All steel hitherto produced by the company has been made in crucible or open-hearth furnaces.

# THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, Pres. and Treas.

Charles G. Phillips, Vice-Pres.

Fritz J. Frank, Secretary

M. C. Robbins, Gen. Mgr.

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Park Building. Boston: Equitable Building. Philadelphia; Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, \$5.00 per year; single copy, 20 cents; to Canada, \$7.50 per year; to other foreign countries, \$10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

### Relations Severed with Germany

That this country may not be embroiled in war with Germany is our earnest prayer. For practically two years we have been in danger of such a deplorable development in our relations. When the Lusitania was sunk by a German submarine without warning, and scores of Americans lost their lives, such a storm of wrath arose against Germany that if our Government had then decided to take summary action and precipitate hostilities the people would have approved such a step by an overwhelming majority. But our statesmen counseled moderation, in the hope that the world-wide denunciation of this outbreak of barbarism would cause the nation responsible for it to shrink from a repetition of the outrage against humanity.

The representations of our Government and other neutrals appeared to have some effect in restraining Germany from a similar exhibition of brutality, but after a time other passenger vessels and even vessels used for hospitals and for other beneficent purposes were torpedoed, more American lives were sacrificed and the tide of American indignation continued to rise. Excuses and explanations by Germany followed each outrage of this character, evidently made for the purpose of softening our wrath and restraining us from actively joining the increasing array of enemy nations. The persistent activity of Germany's warfare against unarmed vessels has shown that the German leaders have not abated their ruthless determination to carry their war policy of frightfulness to the limit of their submarine power. The American people have long realized that eventually the news of some appalling marine calamity would carry horror to many American homes and that the provocation to war would come suddenly.

In all these trying experiences our Government has sought to maintain peace. It has been slow to anger. It has been patient to the point of meekness. It has accepted excuses and waited for more ample explanations. Our President has zealously labored in the meantime to bring the belligerent nations together to discuss terms of peace. His earnestness in endeavoring to find some common ground on which the warring nations might be brought for this purpose has secured for him the commendation of the world. But Germany has taken his conciliatory attitude as an indication of weakness and timidity. Presuming upon the love of

peace among our people and the reluctance of our President to invoke harsh measures, Germany's assumption of imperial power over all nations has broken the bounds of reason by notifying us that all vessels, whether passenger steamers or freighters, found within certain waters will be sunk, but graciously permitting one American vessel a week to go to and from one specified British port, if painted in a specified pattern for identification.

The President's answer to this communication has been the presentation to the German Ambassador of his passports and the recall of our Ambassador to Germany. It was a momentous step to take, involving perhaps most serious consequences, but the unanimous expression of approval and support from all classes of our people shows that in their opinion it was the proper one. To have failed to rebuke such an interference with our freedom of movement on the sea would have been ignominious. To submit to it would have been an unthinkable humiliation. While the action of our Government is not a declaration of war, the step taken undoubtedly means that, if Germany should sink without warning any vessel carrying the American flag, war with that country would then follow. Germany can now add another power to its already formidable array of enemies if it chooses to do so. The decision lies entirely with Germany.

#### Our Manganese Position

Two facts, of considerable importance to the steel industry of the United States, stand out prominently in the developments of 1916. They have been probably lost sight of in the attention paid to more striking results in exports, production and prices. In the first few months of the war great concern was felt as to the supplies of manganese ore and ferromanganese, should the conflict last even for a shorter period than it has. The dependence of our entire steel industry has been resting, and does yet to a great degree, on foreign sources for these materials. But truly unexpected results have been achieved.

An analysis of the manganese situation of this country on another page of this issue reveals the fact that our production of ferromanganese last year of 208,389 gross tons not only greatly exceeded all previous records, but would have been sufficient to take care of the entire steel output of over 31,000,000 tons in 1913. It was also more than double the normal output, taking the average for the five years, 1910 to 1914, as the basis. The production for the last quarter was 61,687 tons, or over 20,000 tons per month. The spiegeleisen production also was beyond any calculations—over 197,000 tons, with the rate in November and December at over 24,000 tons per month. At this rate our production of ferromanganese will soon exceed the British and lead the world, if it does not already.

In manganese ore supplies still more striking records were made. The imports probably exceeded 560,000 tons, almost entirely from Brazil. For the first time they were larger than those of Great Britain, until last year the largest importer of manganese ore in the world. Our imports exceeded the British by over 120,000 tons. But despite this great stimulus only 27,000 tons of manganese ore was mined in our own country last year-and it was nearly a record year-or only enough to make about 10,000 tons of ferromanga-Its paucity is more fully realized when it is stated that to supply our steel output for 1916 with ferromanganese made in our own furnaces, over 750,000 tons of manganese ore would have been necessary.

Ferromanganese is the only material in the steel industry which has declined in price in the past year. It reached its highest quotation about a year ago, when it sold for over \$400 per ton, as contrasted with its price in recent months of \$164 to \$175 per ton.

It is gratifying to realize that our own efforts have resulted in supplying over 70 per cent of our own ferromanganese needs, whereas before the war we made less than 50 per cent of these requirments, depending on the British imported alloy for the rest. It is not a source of comfort, however, to feel that, were war to cut off our sea trade, our steel industry would be seriously crippled for lack of ferromanganese, without which thus far steel has not been successfully made. This menace should often be emphasized in these eventful days, for no efficient substitute has thus far been offered.

#### Steel Exports After the War

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If the neutral countries merely begin where they left off before the war, in the matter of demand for steel, their requirements after the war will be very large. If they find themselves in position to make up for some of the lost time, their consumption will be still larger. The question whence the demand will be met is a very complicated one, seeing that some observers expect continued buying of American steel on the part of the present belligerents, others expect the belligerents to seek neutral trade with more energy than ever, while still others profess a serious fear that the United States may be overrun with foreign steel.

On account of the increase in steel-making capacity in the United States, already accomplished and in progress, it will be necessary for exports to be much larger after the war than before, in order to maintain the former proportion between domestic and export trade. A brief résumé of international commerce in iron and steel may be of interest.

In the last decade of the nineteenth century Great

Britain's iron and steel exports averaged about 3,000,000 gross tons a year, exports of both the United States and Germany falling somewhat short of a million tons. German exports then increased rapidly, and while the British exports increased somewhat Germany passed Great Britain in 1910 by 3 per cent. Exports of the three countries in 1910 were: United States, 1,535,698 tons; United Kingdom, 4,735,734 tons; Germany, 4,868,522 tons, a total of 11,139,954 tons. Machinery is excluded, the figures in general including scrap, pig iron, rolled iron and steel, etc. The three countries exported to each other to a limited extent, but there were also Belgian and French exports, so that the non-producing countries took more than 10,000,000 tons.

After 1910 the exports of the United States and Great Britain increased materially, while German exports increased very sharply, so that in 1913, the year before the war, the figures stood: United States, 2,745,635 tons; Great Britain, 5,049,090 tons; Germany, 6,497,262 tons; total, 14,291,987 tons. Financial conditions in all the neutral countries were not entirely satisfactory by any means. Allowing for that fact, for the fact that some of the exports of the three countries were not to non-producing countries, and to the fact that there were exports by other than the three countries, it seems fair to estimate that just prior to the war, under favorable conditions, the non-producing countries were capable of absorbing 15,000,000 tons of material a year, chiefly in the form of rolled steel or material further fabricated, but exclusive of machinery.

The production of rolled iron and steel in the United States in 1913 was 24,791,243 tons. In the course of a couple of years the capacity is likely to be at least 38,000,000 tons, allowing for no change in rolled iron capacity and an increase in rolled steel capacity approximately as great as the increase in steel ingot capacity, which promises to result in an ingot capacity of about 49,000,000 tons when the present new construction program is completed.

In the past two years German, French and Belgian exports have been practically nil. British exports were 3,248,046 tons in 1915 and 3,357,829 tons in 1916, while exports of the United States were 3,513,453 tons in 1915 and about 6,000,000 tons in 1916. A considerable portion of the British exports were to France, while the major part of the American exports were to the allies. The non-producing countries received less than 5,000,000 tons a year instead of their possible 15,000,000 tons.

A considerable part of the iron and steel buying by neutral countries before the war was due to salesmanship and financing on the part of the sellers, but a very considerable part was undoubtedly spontaneous demand, which would be represented by the buyer going to the seller and making the purchase and then making the payment. Demand of this character has undoubtedly been accumulating during the war, seeing how small have been the receipts of the non-producing countries. The demand immediately after the war is likely to be sufficient to engage the available vessel capacity, and for a short time at least the business may be regulated by transportation facilities more than by anything else. Later the other forces, salesmanship and financing, will come into play. The possible tonnage may amount to one-half the productive capacity of the United States, and this country's share in the business will be determined by the factors now being earnestly discussed in so many quarters.

#### Some Phases of the Railroad Problem

A letter to THE IRON AGE which appears elsewhere in this issue points out some of the far-reaching effects of our inadequate railroad facilities. The writer shows how it is interfering with the operations of architects, contractors who install lighting equipment and the lighting fixture manufacturers, which is not at all surprising. It would be difficult, indeed, to find a trade or line of endeavor which has not been adversely affected by delays in deliveries. Take the matter of lead, for instance; within the past week two or three lead-working plants in the East have been compelled to shut down because they could not get the soft metal from the West, while others have contemplated similar action.

Our correspondent seems to believe that relief can be obtained by legislation, but with this suggestion—as promising anything like an early remedy we are not ready to agree. Relief must come from processes which are already at work, such as the expenditure by the railroads of money in the purchase of additional equipment, improvement of terminals, etc. The writer of the letter states that "representations to the legislators on the part of the manufacturers" will be of little avail for the reason that "they are held in no more favor than the railroads." He goes on to suggest, however, that some good might be accomplished if employees, "both mechanical and clerical, both union and non-union, were to voice their protest" to our law-making representatives. In our opinion it is not more laws, but the fairer application of those in existence, which will help solve the situation, and we are inclined to believe that this is what our correspondent

That the railroads need additional motive power as well as freight cars is borne out by the lively rate at which they have recently been ordering locomotives. Some shippers have maintained that the shortage of power was quite as serious as, if not more than, the shortage of cars. Yet the outcome of an investigation conducted in Nebraska last year by inspectors of the Interstate Commerce Commission into complaints lodged against two great graincarrying roads of that State was that the railroads are furnishing "all the cars they possibly can to supply the unprecedented demand," and that "if it were possible to furnish more equipment the business would not and could not be handled as satisfactorily as it is at present." This may have been true with those Western roads, but hardly so with at least one line in the East, which is reported to be using large Pacific-type freight locomotives to haul passenger trains.

Relief in this direction will come gradually as deliveries are made of the locomotives which were ordered last year. At the present time deliveries on new orders cannot be promised this side of December. Relief to come in the next few months will be to some extent minimized by the fact that locomotives have been pushed hard since last summer, have been kept out of the shops so far as

possible, and repairs which should have been taken in time have been allowed to become more serious, with the ultimate result that the locomotives will stay longer in the shops when they do get there. A reassuring feature with regard to most of the new locomotives to be delivered is that they are designed for increased service; in other words, they will have sufficient power to haul longer and heavier trains. Incidentally it must not be overlooked what the roads have been doing to make their old locomotives more efficient by the installation of superheaters, brick arches and other energy-conserving appliances.

Still another factor which is adding to the stress bearing on the roads is the shortage of shopmen, or car-repair men and freight handlers. It has been particularly difficult to get men at points near the automobile and munitions plants, for obvious reasons. The lack of adequate terminal facilities is an old question, though none the less serious, and one in which shippers themselves can help by not making shipments of which ultimate distribution cannot be promptly made. They also can help by minimizing, as far as possible, the shipping of part carloads, as leading trunk lines are pointing out.

### CORRESPONDENCE

#### Railroad Equipment Shortage

To the Editor: The shortage of equipment on the part of the railroads, the reason for which is so clearly presented in the editorial in The Iron Age of Jan. 4, is so far-reaching in its effects that it would seem as if no one could escape the lesson set forth in that editorial, which is, "that the nation cannot thrive as it should if its transportation system is not properly treated."

It may seem a far cry from the rolling stock of a railroad to the installation of lighting equipment in a residence or building. The writer, however, is in touch with several contracts of this character which are hanging fire and cannot be signed up because the architects have not the faintest idea when the structures which they have under their supervision will be ready for interior equipment. The general contractors in turn are unable to give the architects the required information for the reason that they do not know when the material which they have on order will be shipped. And so we can step by step follow this state of affairs clear back to the ore or other raw product which is held up because of lack of transportation facilities.

The lighting fixture manufacturer may have all of his materials and be ready to carry out his part of the contract, but the architect takes the very proper attitude that it is not to the interest of his client to tie up money in articles which may not be required for months. The manufacturer, on the other hand, cannot accept numerous orders which involve the expenditure of capital for labor and materials and agree to wait indefinitely for his money. And so his output becomes restricted.

It is hardly to be hoped that any relief will be obtained by representations to legislators on the part of the manufacturers. They are held in no more favor than the railroads. However, if the employees, both mechanical and clerical, both union and non-union, were to voice their protest, it might successfully appeal to our representatives, as they do not seem susceptible to any argument but the vote.

H. D. M.

The New York Shipbuilding Corporation, Camden, N. J., has removed its New York office from 50 Church Street to 120 Broadway. Edwin B. Sadtler is agent for the corporation.

# A Spontaneous Mobilization of Industry

Offers of Assistance to the United States Government by Individuals and Companies in the Event of a National Emergency

YELDOM has this country experienced such an instantaneous crystallization of national sentiment as that which followed the announcement on Saturday of the severance of relations with Germany. gress was occupied with revenue and immigration bills and sectional divisions were registered in the voting. Meanwhile indifferent attention had seemed to be paid by the Administration, so far as surface conditions indicated, to the perfection of preparedness for which so much had been done by the engineering societies under the direction of a subcommittee of the Naval Consulting Board. Strained international relations were regarded as remote though possible, but the country had been alert since the knowledge on last Thursday of the German proclamation of unrestricted submarine warfare and a wave of enthusiastic approval swept over the land when the President's answer to Germany's communication became known.

A flood of offers of services began to pour into Washington by Sunday, from individuals and industries. In-numerable others, The Iron Age finds, are forthcoming on the asking. If anything there are signs of a temporary embarrassment to the orderly organization of the country for a war eventuality, in the rush upon Congress and the War and Navy Departments. The avalanche of bills being offered in the Senate and the

House may be cited.

Whatever may be said of the deliberation which has marked the slow progress of national defense preparations, the outstanding fact now is the pronounced unanimity of the country's industrial establishments to give absolute priority to the country's business when offered, without let or hindrance, a fact which merely needed a condition like the present to prove. In the interval since Sunday, THE IRON AGE has made a brief canvass of the attitude of the industries which it serves, and the subjoined compilation, necessarily limited, will bear out the foregoing statement. It is rather interesting to add that the first message received by THE IRON AGE in this connection was a cablegram in part as fol-

Metal Bulletin of London on behalf British Metal Trades congratulates United States' determined stand for humanity

It is natural that the inventory taken last summer for the Naval Consulting Board's committee on industrial preparedness should now be referred to by manufacturers and one of our first communications is to the effect that Illinois manufacturers reiterate without exception their willingness to devote their plans to whatever the Government may require and hold themselves in readiness to set aside all other work to that end. Under the direction of Frederick K. Copeland, president Sullivan Machinery Company, Chicago, the original Illinois canvass was made, each company submitting a statement of its facilities for the service of the Government if needed. Interviews with a large number of these manufacturers support this statement in practically the same general terms. In no case was there the slightest hesitation in acknowledging that Government service would have first claim upon all their resources and a general willingness was expressed to make whatever changes in their plants as might be necessary to accommodate them to the Government's need.

On Sunday, E. A. S. Clarke, president Lackawanna Steel Company, telegraphed to both the Secretary of War and the Secretary of the Navy as follows: "Lackawanna Steel Company desires to offer its services to the Government at this time in whatever way it can be of

assistance either through its products or through its organization."

W. S. Pilling, Pilling & Crane, Philadelphia, also Northern Iron Company, Port Henry, N. Y., maker of standard low-phosphorus pig fron, said in an interview: "We already have been approached by three or four firms which manufacture armament, projectiles and the like, who have asked if we can supply them with larger tonnages than they have under contract. Our answer has been that all depends on the extent to which we can cut down export shipments and those for private domestic consumption. In no other way can we help them, and some question may be raised as to its fairness, but if the need is urgent we believe that no objection can be raised to this course. If it is a case of war the Government comes first, regardless of the question of money. There is no question but that munitions makers who have foreign contracts would cut down their deliveries in order to serve the home Government, unless co-operation by means of the export of munitions is the best procedure.

Alba B. Johnson, president Baldwin Locomotive Works, Philadelphia, had the following to say: "In the event of war the Baldwin Locomotive Works are at the disposal of the United States Government. have finished some of our foreign contracts and are completing others. We have ample facilities to obviate the necessity of breaking faith with any foreign pur-

In Cincinnati and vicinity, with not a single exception, all manufacturers interviewed state emphatically that in any emergency their plants are at the disposal of the Government. A few have already given instructions to give Government orders in hand for machine tools precedence over all others. The present situation has developed the fact that Government business placed quietly in the past year was in larger volume than the public appreciated. All plants are operating more equipment than at any time heretofore. No orders have been issued thus far to reserve space for Government needs, but every manufacturer has plans made for meeting any situation that may arise. views of firms quoted below indicate the trend of sentiment as far as Government support is concerned:

American Tool Works Company, Cincinnati: "Government orders will receive precedence over all others. We have not yet reeived any hurry-up instructions on

Government contracts already under way."

R. K. Leblond Machine Tool Company, Cincinnati: "If necessary we will turn down all foreign and domestic business to take care of rush Government

Lunkheimer Company, Cincinnati: "All orders from either the Army or Navy Departments will positively

be given first consideration."

Bickett Machine & Mfg. Company, Cincinnati: "We stand ready to aid the Government in any crisis." Cincinnati Planer Company, Cincinnati: "Thi

Cincinnati: plant and those allied with us will take prompt steps to fill any orders entrusted to us."

King Machine Tool Company, Cincinnati: time ago we gave a complete statement to the Government of our capacity, which will be placed at its disposal when needed."

A. Fay & Egan Company, Cincinnati: "We will let neither our domestic nor foreign business inter-fere with Government orders."

Tudor Boiler Works Company, Cincinnati: "Ou plant is at the disposal of the Government at any time."

Boye & Emmes Machine Tool Company, Cincinnati:
"Requirements of the United States Government are first with us, but we have not been called on to make arrangements for the future."

Brownell Company, Dayton, Ohio: "Our plant is

already equipped for some work that the Government may require, and we are willing to cut out all other business when necessary."

Peters Cartridge Company, Kings Mills, Ohio: "We have already wired the President placing our plant at his disposal."

Edwards Mfg. Company, Cincinnati: "We are already doing some Government business and only await instructions to increase our capacity."

James I. Stephenson, president Cincinnati Iron & Steel Company, offers both of his plants for Government service in case of need.

Expressions of the feeling in New England were typically as follows:

George I. Alden, president Norton Grinding Company, Worcester, Mass.: "We would certainly do anything we could that was within our power to help the Government. We have no definite idea as to how our export business will be affected as we deliver to parties at American ports and have no knowledge of the manner in which the goods are sent abroad."

L. M. Waite, vice-president Fitchburg Machine Works, Fitchburg, Mass.: "We are ready to do everything we can at this time to be of help to our own Government. We do not expect that there will be any great change in our export conditions."

E. P. Bullard, president Bullard Machine Tool Company, Bridgeport, Conn.: "There is nothing we would leave undone to be of service at this time. We have made no munition machinery for a year. Our export business is only normal as we are very busy almost wholly on domestic business and have given no particular thought to the future of the export business."

Practically all of the other munition plants in New England have wired offers to the Government.

Expressions from steel and other companies in Cleveland, Ohio, were as follows:

National Acme Mfg. Company: "Everything we have is at the disposal of the Government, and if we see that it is needed we will offer our plant before being asked."

Corrigan, McKinney & Company: "We will do everything that we can to supply the Government's needs."

Warner & Swasey Company: "As far as our facilities can be utilized, they are at the command of the Government. Everything else will be subservient." Cleveland Punch & Shear Works Company: "We

Cleveland Punch & Shear Works Company: "We will gladly do all we can to serve the needs of the Government."

Brown Hoisting Machinery Company: "We will furnish and build for the Government such equipment as we are able to turn out, giving this work preference."

American Shipbuilding Company: "Our facilities, if needed, will be at the disposal of the Government, such orders having preference."

McMyler Interstate Company: "We will do all that is necessary to help the Government."

Kilby Manufacturing Company: "We will be as patriotic as anybody and do our little bit to help when needed."

Wellman-Seaver-Morgan Company: "We will willingly offer anything we have to the Government, giving it preference."

Cleveland Hardware Company: "We shall be only too glad to do anything we can for the Government in preference to other work."

Upson Nut Company: "We have stood back of the Government in the past and will stand back of it now, supplying what it needs in preference to foreign demands."

Cleveland Crane & Engineering Co.: "We are doing work for the Government now, and our whole plant is at its disposal."

Standard Parts Company: "We shall do all we can to co-operate with the Government and do all it wants."

B. F. Stearns Company: "Our plant is available for any use it can be put to for supplying the Government's needs."

Peerless Motor Car Company: "We are always

ready and willing to turn over our plant to the Gov-ernment."

Chisholm & Moore Mfg. Company: "We shall do everything we can to help the Government if our manufacturing facilities are needed."

Forest City Machine & Forge Company: "We are ready to turn our munition plant over to the Government at any minute. We are just finishing up some other work and have held off taking additional work in the last day or two in view of the possibility of our plant being needed."

Cleveland Twist Drill Company: "In case of war we shall be glad to give preference to Government orders and to orders from private companies having United States munition contracts."

Atlas Car & Manufacturing Company: "Our plant is at the service of the Government, and we shall gladly do anything we can."

Champion Rivet Company: "What belongs to us belongs to the Government. We shall give our first thought and first action to our country."

Officials of steel works and other manufacturing plants in the Youngstown, Ohio, district, and also in the Shenango Valley, Pa., are on record as stating that their entire resources are at the disposal of the United States Government. James H. Campbell, president, Youngstown Sheet & Tube Company, stated on Monday that his company had been filling orders for the Allies for different products, but that the entire facilities were at the call of the Government.

The Brier Hill Steel Company has been making more or less steel for the Allies, and has stated that the entire organization will be held in readiness for any call that the Government may make. Similar opinions have been expressed by the Youngstown Iron & Steel Company and by the Republic Iron & Steel Company.

In the Shenango Valley, Pa., the Driggs-Seabury Ordnance Company, Sharon, has made large quantities of shells for the Allies, and is now turning out rapid-fire guns for the British Government. The company employs about 1700 men. This plant is at the disposal of the Government.

At Youngstown, Ohio, the William Tod Company, since the war broke out has been turning out thousands of shells for the Allies, but since this company was taken over some months ago by the United Engineering & Foundry Company it has been gradually discarding the making of shells. Complete shells were made. This plant is also at the disposal of the Government.

The United States Steel Corporation stands ready to aid the Government in every possible manner in the event of war, according to Judge Elbert H. Gary, chairman of the board of directors.

Guy E. Tripp, chairman of the board, Westinghouse Electric & Mfg. Company, Pittsburgh, makes an interesting point when he says that the Federal authorities, if they decide to take over such industries as will be of service in case of war, will have an easy time of it. American industry is already pretty well mobilized on a war basis, and has been mobilizing for the last two years and more.

In the event of hostilities, the du Pont Powder Company, Wilmington, Del., will place its plants at the disposal of the Government. This announcement has been authorized lately and the attitude referred to as the policy of the company. Its capacity is about 1,000,000 lb. of military powder a day, plus large capacity for other explosives.

W. A. Morgan, president Buffalo Copper & Brass Rolling Mill, Buffalo, N. Y., has wired President Wilson tendering the plant, next to the largest brass plant in the world, to the War and Navy Departments.

Sentiment in New York is represented by the following expressions from a few representative companies:

Charles M. Schwab. president Bethlehem Steel Company: "I believe Bethlehem is now one of the greatest assets the United States has and . . . in the event that the time ever comes when it needs it, the plant will be at the disposal of the United States Gov-

C. D. Eaton, American Car & Foundry Company: "Our men and equipment are at the disposal of the Government when desired. The success which this company has had in the manufacture of shells for the Allies would make it valuable in producing munition for the United States.

"In case of belligerency," President Andrew Fletcher, American Locomotive Company, said, "our company could best serve the common aim by pushing its work on the 360 locomotives under manufacture for the French, Italian and Russian governments and on the shells ordered by the Allied Powers. After completing the orders for small shells, the machines were sold and larger ones installed to produce the 6, 8 and 9.2-in. sizes. If the American Government desires shells of

this size the plant is excellently equipped."

Henry R. Towne, chairman of the board of directors, Yale & Towne Mfg. Co., said: "We are ready to do everything in our power when the time comes."

President E. H. Wells, Babcock & Wilcox Company: "In agreement with the Government we are giving

preference to Government work at the present time, setting aside commercial orders, and we shall continue to do so.

Frederick L. Eberhardt, president and general manager, Gould & Eberhardt Company, Newark, N. J.: "We reported the company's facilities when the naval commission requested. We have many domestic orders which we will set aside if the Government requests it."

Secretary M. B. Parker, Railway Steel Spring Co.: "The plant of this company could hardly be used unless entirely reconverted, since the men are trained only in producing springs and wheels and the machines are too large for shells.'

President J. C. Cullen, Niles-Bement-Pond Company: "We have not been approached and have not yet offered our services."

### First Pan-American Aeronautic Congress

The first annual Pan-American Aeronautic Exposition and Congress will be held in the Grand Central Palace. New York, Feb. 8 to 15, under the auspices of the Aero Club of America, the Pan-American Aeronautic Federation and the American Society of Aeronautic Engineers. Plans to be presented and discussed will deal with the development of military, scientific and sporting relations and the aeronautic resources of the United States and of South and Central America. The Grand Central Palace has been handsomely decorated, aircraft of practically every type and description will be shown by the most prominent constructors, and the latest aeronautic motors and accessories will be exhibited, together with the latest type of machine and anti-aircraft guns and cannon. The United States Government will be represented in all its departments having to do with aeronautics and will exhibit the latest war equipment. Scientific instruments for testing and determining the weather will be exhibited by the U. S. Bureau of Standards and the Weather Bureau.

For each week day of the exposition except the first, programs have been prepared for afternoon and evening sessions at which the various phases of the industry have been assigned special places and at which prominent men from all over the country will take an active part either by the presentation of papers or by participation in general discussions. At the session Friday afternoon, Feb. 9, Henry Souther, technical adviser, Aviation Section, Signal Corps, U. S. Army, will tell what aeroplane parts the Aviation Section of the Army believes could be standardized in the immediate future, illustrating the subject on the screen. Aero-nautic motors will be discussed at the same meeting, and in the evening of that day papers and discussions on aeroplane construction will form a prominent feature.

The Matthew Addy Company, pig-iron and coke merchant, whose head office is at Cincinnati, Ohio, has increased its capital from \$150,000 to \$200,000. increase was made to take care of the company's expanding business.

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#### Meeting on Aeronautic Engineering

A meeting on aeronautic engineering will be held by the Society of Automobile Engineers, Feb. 9, at the Engineering Societies Building, 29 West Thirty-ninth Street, New York. The afternoon session on that day will be devoted to a discussion of the possibility of standardizing parts used in airplane construction; while the evening session will be more general, including motion pictures of various types of aircraft in flight. F. G. Diffin will speak on the standardization of metal parts. The afternoon session will be pre-sided over by Henry Souther, consulting engineer on aeronautics to the War Department, and the evening session by Charles M. Manly, vice-president Curtiss Aeroplane Company and second vice-president of the Society of Automobile Engineers.

#### PIG-IRON OUTPUT LESS

# Daily Rate Declines Almost 1000 Tons

#### A Net Gain of One Stack, but Capacity of Furnaces in Blast Is Lower

In January the production of pig iron, exclusive of charcoal iron, was 3,150,938 gross tons or 101,643 tons a day, as compared with 3,178,651 tons in the preceding month or 102,537 tons a day. This falling off is attributed to a continuance of car shortages and coke delivery troubles, combined with furnaces going out for relining after long runs. The changes due to furnaces going in and out of blast increased the number of stacks active Feb. 1 by one to 312, as compared with 311 on Jan. 1, but based on the performance in January there was a decline in the capacity of the active furnaces from 101,9,5 tons a day on Jan. 1 to 101,866 tons on Feb. 1.

#### Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from January, 1916, is as follows:

Daily Rate of Pig-Iron Production by Months-Gross Tons

Steel Works	Merchant	Total
January, 191672,614	30,132	102,746
February	31,151	106,456
March	31,393	107,667
April	30,366	107,592
May	30,716	108,422
June	30,527 29,620	107,053
July	28.729	103.346
August	29.755	106,745
October	31.550	113.189
November80,141	30,253	110.394
December	28,273	102,537
January, 1917	29,249	101,643

#### Capacity in Blast February 1 and January 1

The following table shows the daily capacity in gross tons of furnaces in blast Feb. 1 and Jan. 1 by districts:

Coke and Anthracite Furnaces in Blast

	Total	F	eb. 1————————————————————————————————————	Ja	n. 1
Location of n	umber	Number	Capacity	Number	Capacity
	stacks	in blast	per day	in blast	per day
New York:					
Buffalo	19	14	4,430	14	4,592
Other New York		2	420	3	532
New Jersey	6	1	205	1	213
Pennsylvania:					
Lehigh Valley	21	13	3,312	13	3,465
Spiegel	2	2	204	2	207
Schuylkill Val	12	10	2,953	3	2,334
Lower Susque-					
hanna	6	5	1,439	5	1,355
Lebanon Valley Ferro and		49	180	6	852
Spiegel	3	3	161	3	168
Pittsburgh Dist. Ferro and	53	42	20,633	13	21,305
Spiegel	3	3	502	3	667
Shenango Val	19	18	5,574	19	5,887
Western Penn-					
sylvania	24	19	5.884	16	4.653
Ferro and					
Spiegel	3	1	138	2	121
Maryland		3	1.169	3	1,183
Ferro		- 1	9.9	1	109
Wheeling District.		12	4,000	13	4,358
Ohio:					
Mahoning Val	25	24	10,157	22	9,874
Central and					
Northern		21	7,817	21	7.707
Hocking Val.,					
& Hang'g R'k	1.5	13	1,650	12	1.550
Illinois and Ind	35	32	15,425	33	16,138
Ferro	2	2	127	1	97
Michigan, Wis. &					
Minn	12	10	2,897	10	2,71
Colorado & Mis-					
souri	7	3	1.031	4	1,280
The South:					
Virginia	18	8	1.095	59	1,246
Kentucky		4	596	4	59
Alabama		31	8,055	29	7.58
Ferro		0	0	1	3:
Tennessee		10	1,113	9	1.16
Total		312	101.866	311	101,97

#### Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

	1.	ouncion o	A wieer co	mpunies-	111088	L'Ons	
		Pig. 1	total produ 1916	iction————————————————————————————————————	Spie ferre 1915	geleiser omanga 1916	and inese 1917
Jan.		.1,115.944	2,251,035	2.244,203	18.041	24,866	20 500
		.1,237,380	2,183,845		13.319	09 655	00,192
Feb.						23,877	· · · · · ·
Mar.		.1,551,082	2,365,116		12,274	29,388	
Apr.		.1,584,111	2,316,768		12,337	31,862	
							10000
May		.1,694,290	2,408,890		13,440	35,844	
June		.1,770,657	2,295,784		19,200	38,597	
July		.1,949,750	2,306,303		17,854	31,353	*****
Aug.		.2,101,818	2,313,122		27,463	33.338	
Sept.		.2,129,322	2,309,710		23,159	29,451	*****
Oct.		.2,281,456	2,530,806		23,992	34,566	*****
Nov.		.2,198,459	2,404,210		28,741	44,975	*****
France.		OF GOOD PLAN	0.001.000		05 004	400 4000	

Among the furnaces blown in between Jan. 1 and Feb. 1 were the B stack of the Buffalo Union Furnace Company and Harriet X in the Buffalo district, one Crane in the Lehigh Valley, one Worth in the Schuyl-kill Valley, Top Mill in the Wheeling district, one Ohio and one Hubbard in the Mahoning Valley, and Milton in the Hanging Rock district.

The furnaces blown out last month include one Lackawanna, one Susquehanna and Standish in New York, one Bethlehem in the Lehigh Valley, one Bird Coleman in the Lower Susquehanna Valley, Newcastle No. 2 in the Shenango Valley, Marshall in western Pennsylvania, Alleghany in Virginia, one Bellaire in the Wheeling district, the stack of the Mississippi Valley Iron Company in Missouri, and Wayne in Michigan.

#### Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in January and the three months preceding:

Monthly Pig-Iron Production-Gross Tons Oct

Nov

	(31 days)	(30 days)	(31 days)	(31 days)
New York	194,657	183,906	154,496	159.887
New Jersey	7,431	6.384	6,610	6,347
Lehigh Valley		121,948	113,863	
Schuylkill Valley		90.119	69,543	
Lower Susquehanna and			20,000	
Lebanon Valley		78.079	73,835	74,627
Pittsburgh district	812,572	723,997	681,133	
Shenango Valley	194,534	183,273	186,378	179,356
Western Pennsylvania.		181,409	178,603	187,302
Maryland, Virginia and		2021200	2 10,000	2011002
Kentucky		89,100	83,850	92,332
Wheeling district		140,245	135,102	124,505
Mahoning Valley	339,592	318,181	302,475	300,562
Central and Northern		010,101	000,110	o y o java
Ohio	273,485	258,609	241,935	242,342
Hocking Valley and		=00,000	222,000	-10,010
Hanging Rock	50,797	50,966	45,819	47,948
Chicago district		489,158	503,309	475,803
		400,100	000,000	110,000
Mich., Minn., Mo., Wis.		127,873	128,293	126,352
and Col		234.095	238,558	249,694
Alabama	248,863		34,849	34,516
Tennessee	32,374	34,469	94,010	07,020
Total	2 508 849	2 211 811	3 178 651	3.150.938

### The Record of Production

Production of Coke and Anthracite Pig Iron in the United

States by	Months Since	Jan. 1, 191	3-Gross 1	ons
1913	1914	1915	1916	1917
Jan 2,795.33	31 1.885,054	1,601,421	3,185,121	3,150,938
Feb 2,586,33	37 1,888,670	1,674,771	3,087,212	******
Mar 2,763,50	63 2.347.867	2,063,834	3,337,691	******
Apr 2,752,70	61 2,269,655	2,116,494	3,227,768	*******
May 2,822,2	17 2,092,686	2,263,470	3,361,073	******
June 2,628,5	65 1,917,783	2,380,827	3,211,588	
July 2,560,6	46 1,957,645	2,563,420	3,224,513	
Aug 2,545,7	63 1,995,261	2,779,647	3,203,713	******
Sept 2,505,9:	27 1,882,577	2.852,561	3,202,366	*******
Oct 2,546,2	61 1,778,186	3,125,491	3,508,849	******
Nov 2,233,1	23 1.518.316	3,037,308	3,311,811	*******
Dec 1,983,6	07 1,515,752	3,203,322	3,178,651	
Total,				
yr30,724,1	01 23,049,752	29,662,566	39,039,356	

The figures for daily average production, beginning January, 1910, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1910

			6	1088 T	ons			+027
	1910	1911	1912	1913	1914	1915	1916	1917
Jan.	84.148		66,384			51,659	102,746	101'949
Feb.	85,616	64.090	72,442	92.369	67.453	59,813	106,456	
Mar.			77,591			66,575	107,667	275440
ADr.			79,181				107,592	
May			81,051			73.015	108,422	
June			81.358			79.361	107.053	* * * * * * *
July			77,738				104,017	
Aug.			81.046			89,666	103,346	
Sept.			82,128			95.085	106,745	******
Oct.	67.520	67.811	86.722	82 133	57.361	100,822	113,189	*****
Nov.	63 659	66.648	87 697	74.453	50.611	101,244	110,394	
Dag	57 240	65 019	50 766	69 000	40 000	102 222	102.537	

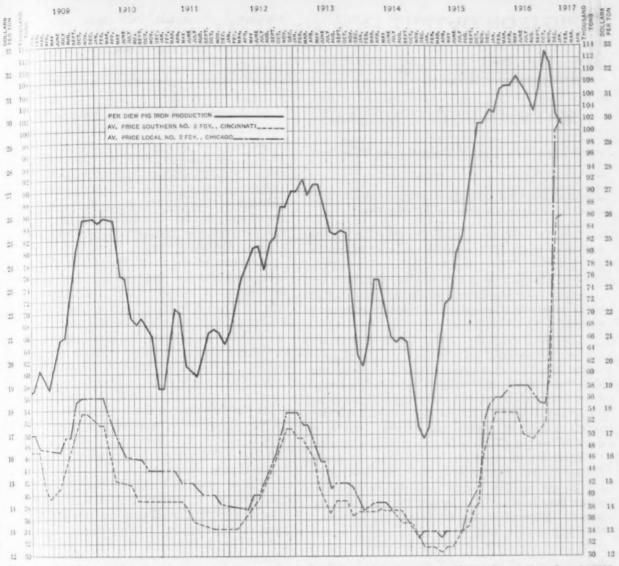


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from Jan. 1, 1908, to Feb. 1, 1917; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

#### Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1909, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production, by months of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON ACE.

#### Blast Furnace Notes

It is reported that E. J. Lavino & Co., Philadelphia, and associated interests have bought the old Vesta blast furnace at Marietta, Pa., and after repairs will put it on spiegeleisen and ferromanganese.

The lining of the No. 1 furnace of the Lackawanna Steel Company fell in on Jan. 30.

The Saucon furnace in the Lehigh Valley which was banked on Dec. 19 became active again on Jan. 3.

In the Shenango Valley, New Castle furnace No. 2 of the Carnegie Steel Company was blown out Jan. 17.

Top Mill furnace of the Wheeling Steel & Iron Company, which was banked on Dec. 25, resumed operations Jan. 10.

The Hubbard and Ohio furnaces which were banked the latter part of December have been blown in.

The Wayne stack of the Detroit Furnace Company was banked Jan. 15.

Alleghany furnace in Virginia was blown out Jan. 7.

#### New Heroult Furnace Installations

New installations of Heroult electric steel furnaces have been licensed as follows by the United States Steel Corporation:

The National Malleable Castings Company will install two 15-ton furnaces in its plant at Cleveland, Ohio, to produce malleable castings. The company already has two 6-ton furnaces at its Sharon, Pa., plant making steel castings and three 6-ton furnaces, all of the same type, at its Chicago plant, producing malleable castings.

plant, producing malleable castings.

The Union Electric Steel Company, Carnegie, Pa., will install a 6-ton furnace to produce special alloy steels. It is now operating a 6-ton furnace of the same type.

The contracts for these three furnaces bring the total in the United States and Canada, installed or contracted for, to 103.

#### New Rennerfelt Furnace Installations

Hamilton & Hansel, 17 Battery Place, New York, has sold two more Rennerfelt electric furnaces as follows:

The Parsons Company, Newton, Iowa, will install a 1½-ton furnace, 400 kw., for making steel castings. This furnace will replace the ¾-ton furnace of the same type which the company is now operating.

The United States Government will install a ½-ton furnace, 125 kw., at the Philadelphia Mint, Philadelphia, Pa. It will be used for melting copper and nickel.

The installation of these furnaces will bring the total of this type in the United States to 14.

# Iron and Steel Markets

#### MARKET UNDISTURBED

No Measure Yet of Submarine Warfare

Foreign Demand Strong—Government Buying a Factor—Advances in Pig Iron

It is too early to measure the effect on the iron and steel trade of Germany's unrestricted submarine warfare. The railroads have been the clogging defile in the path from mill to ship, and for a long time exporting has been embarrassed more by the chaos in rail transportation than by the scarcity of vessels.

War buying by the United States Government now at last becomes definite after months of reservation by mills and ordnance makers. Pushing warship material for early rollings may tend to disturb other plate deliveries, but shell steel demand is not likely to be heavy until we have something with which to shoot it. Active negotiations are now under way for big additions to our artillery equipment.

There are no signs that anything in the way of federal control of industry is likely, nor that makers are at all concerned over any price concessions which may be exacted. In fact they are not mentioned. Everywhere the attitude is one of serving the country first, with price a secondary matter. In spite of the additions which the home war-footing program makes to mill business, the Government as a conspicuous buyer appears for the present at least as a stabilizer, leaving prices strong, though with no general further upward tendency.

Federal supervision of the railroads would be welcomed. An orderly movement of freight according to some widely controlling plan is needed. With the Government as a partner, railroad managers would probably be less harassed by restrictions which leave too little time for bare traffic problems. One leading coke producer last week secured only 35 per cent of the number of cars needed.

No cessation in foreign demand is noted. Pig iron inquiries include 10,000 tons from France, half Bessemer and half foundry; 10,000 tons from Chile, and 3000 tons from Holland. India needs 2000 tons of cast-iron pipe and Chile some 3500 tons. Added to 100,000 tons of shell steel billets, taken by mills which could find space in the first half, and part at 4½c. at mill, may be mentioned 400,000 tons which France would like this year. A demand for ship plates comes from six Spanish yards which would take, if available, 75,000 tons over 15 months. A French plate inquiry is for 8000 tons.

Rail commitments have now entered the third quarter of 1918 and 57,000 tons have been closed for that delivery. No less than 150,000 tons of heavy rails and 20,000 tons of medium sections are wanted by France, and England will take 75,000 tons, Italy 2500 tons of light rails, and Cuba is in the market.

The production of pig iron in January fell off from that of December by nearly 28,000 tons, which is hardly as much as might have been expected with all the coke delivery troubles. Our returns show a total of 3,150,938 tons, against 3,178,647 tons fof December. The daily rate was 101,643 tons, or about 900 tons less than in December. This represents the lowest daily output since November, 1915. At that the going rate is now only  $4\frac{1}{2}$  per cent below the average throughout 1916.

Advances of 50c. to \$1 per ton have been made in foundry iron and of \$2 per ton for charcoal iron. An Ohio steel company wants 15,000 tons of basic iron for prompt delivery. For a cast-iron pipe line Rochester, N. Y., may need 10,000 tons.

An advance in domestic ferromanganese of \$50 to \$75 per ton is a tangible evidence of the uncertainties of the international situation. Now \$250 must be paid for first half purchases, with the British product nominally at \$164 at seaboard.

If the foreign demand for Bessemer iron keeps up, the Bessemer ore shortage may exceed 2,000,000 tons, one estimate indeed placing it at about 3,500,000 tons. Some new properties, however, will ship in the coming season.

A large new sheet mill will be built in Ohio. A tire company at Cumberland, Md., will take 7000 tons of structural steel and the Worth Steel Company some 3500 tons. In Philadelphia 7300 tons of material has been bought for four ships. Following advances in mill prices for forward delivery, warehouse prices for steel bars, plates and shapes are up \$3 per ton.

The Ford Motor Company purchases have now been settled for the year beginning July 1, and amount to about 260,000 tons, covering sheets, bars, wire stock, forgings, etc.

An advance of \$4 per ton for butt weld pipe made by the Wheeling Steel & Iron Company appears to indicate an early general advance.

# Pittsburgh

PITTSBURGH, PA., Feb. 6, 1917.

The break in diplomatic relations between the United States and Germany has apparently strengthened prices. The trade realizes that if war should be the outcome heavy demands will be made by the Government on all plants that can turn out munitions and these, of course, will be taken care of first. A large amount of new business would then be given to the steel mills to be filled at the earliest possible moment, which, with the heavy orders already on the books, would crowd production to the limit into next year or longer. Hope prevails that war will be averted. Expressions of opinions from the presidents of leading steel companies in the Pittsburgh and Youngstown districts are to the effect that not only their steel works but their organizations as well are at the entire disposal of the Government, the minute they are needed.

Pig Iron.—W. P. Snyder & Co. report the average price of basic iron in January to have been \$30 per ton at Valley furnace, the same as in December, and Bessemer iron, \$35 at Valley furnace, an advance over the December price of \$0.787. The market on Bessemer is

# A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics At date, one week, one month, and one year previous

For Early Delivery

No. 2, Valley furnace No. 2 Southern, Cin'ti No. 2, Birmingham, Ala. No. 2, furnace, Chicago*	Peb. 7, 1917. 31.00 31.00 26.90 24.00 30.00 30.00 30.50 31.00 29.95 33.75	Jan. 31 1917. \$30,50 31,00 26,90 24,00 30,00 30,00 35,95 31,00 29,95 31,75	, Jan. 3, 1917. \$29.50 31.00 25.90 30.00 30.00 35.95 30.00 29.95 31.75	Feb. 2, 1916. \$20.00 18.50 17.90 15.00 18.50 17.75 21.45 19.00 18.45 19.75	Sheets, Nails and Wire, Per Lb. to Large Buyers: Sheets, black, No. 28, P'gh Sheets, galv., No. 28, P'gh Wire nails, Pittsburgh. Cut nails, Pittsburgh. Fence wire, base, P'gh. Barb wire, galv., P'gh. Old Material, Per Gross 7 Iron rails, Chicago. Iron rails, Chicago.	4.50 6.25 3.00 3.50 2.95 3.85
Rails, Billets, etc., Per Gre Bess, rails, heavy, at mill Oh. rails, heavy, at mill Bess, billets, Pittsburgh Oh. billets, Pittsburgh Forging billets, base, P'gh Oh. billets, Phila Wire rods, Pittsburgh	38.00 40.00 65.00 65.00 65.00 65.00 75.00	38.00 40.00 65.00 65.00 85.00 85.00 75.00	38.00 40.00 60.00 60.00 80.00 60.00 70.00	28.00 30.00 33.00 34.00 35.00 42.00 45.00	Carwheels, Chicago	18.50 20.50 22.00 20.00 21.25 19.00 20.00 25.00 23.50
Finished Iron and Steel, Per Lb. to Large Buyers: Iron bars, Philadelphia Iron bars, Pittsburgh Iron bars, Chicago Steel bars, Pittsburgh Steel bars, New York Tank plates, Pittsburgh Tank plates, New York Beams, etc., Pittsburgh Beams, etc., Pittsburgh Skelp, grooved steel, P'gh Skelp, sheared steel, P'gh Steel hoops, Pittsburgh *The average switching c	3.159 3.25 3.00 3.25 3.419 4.75 4.919 3.25 3.419 3.25 3.50 3.25	3.159 3.25 3.00 3.25 3.419 4.50 4.669 3.25 3.419 2.85 3.00 3.25	3.159 3.25 3.00 3.169 4.25 4.419 2.85 3.00 3.25	2.409 2.15 1.90 2.25 2.419 2.50 2.669 2.00 2.119 1.90 2.00 2.10	Coke, Connellsville, Per N Furnace coke, prompt Furnace coke, future Foundry coke, prompt Foundry coke, future  Metals, Per Lb. to Large Buyers Lake copper, New York. Electrolytic copper, N. Y Spelter, St. Louis Spelter, New York Lead, St. Louis Lead, New York Tin. New York Antimony (Asiatic), N. Y.	6.00 10.00 8,00

the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers: Sheets, black, No. 28, Pgh Sheets, galv. No. 28, Pgh Wire nails, Pittsburgh Cut nails, Pittsburgh Fence wire, base! P'gh Barb wire, galv., P'gh	Feb. 7, 1917. Cents. 4.50 6.25 3.00 3.50 2.95 3.85	Jan. 31, 1917. Cents, 4.50 6.25 3.00 3.50 2.95 3.85	1917. Cents. 4.50 6.25	Feb. 2, 1916. Cents. 2.60 4.75 2.20 2.10 2.05 3.05
Old Material, Per Gross T Iron rails, Chicago Iron rails, Philadelphia Carwheels, Chicago Carwheels, Philadelphia Heavy steel scrap, Pigh Heavy steel scrap, Chigo No. I cast, Pittsburgh No. 1 cast, Chigo (net ton) No. 1 RR. wrot, Chigo (net ton)	on: \$27.00 28.00 18.50 20.50 20.00 20.00 21.25 19.00 25.00 23.50	\$27.00 28.00 18.50 20.50 22.00 20.50 21.00 19.00 20.00 15.50 26.00 23.50	\$27.00 28.00 19.00 22.00 23.00 23.00 21.50 20.00 21.50 27.00 23.50	16.50 14.75 15.75
Coke, Connellsville, Per N Furnace coke, prompt Furnace coke, future Foundry coke, prompt Foundry coke, future	et Ton s \$9.00 6.00 10.00 8.00	\$8.50 6.00 10.00 7.00	\$9.50 5.00 10.00 6.50	\$2,75 2.50 3.50 3.25
Metals, Per Lb. to Large Buyers: Lake copper, New York. Electrolytic copper, N. Y. Spelter, St. Louis. Spelter, New York. Lead, St. Louis Lead, New York. Tin. New York. Antimony (Asiatic), N. Y. Tin plate, 100-lb. box, P'gh.	Cents. 33.00 33.00 10.00 10.25 8.30 8.50 25.00 27.00	33.00 33.00	Cents. 29,50 29,50 9,50 9,75 7,35 7,50 43,00 14,50 87,00	25.50 25.37 1/2

strong at \$35, and on basic at \$30, Valley furnace, but it is doubtful whether any large lots could be had at It is stated that J. P. Morgan & Co. have closed for 60,000 to 65,000 tons of Bessemer iron for Italy, on its recent inquiry for 100,000 tons, most of the iron coming from Eastern furnaces and some from the Ironton, Ohio, and Ashland, Ky. districts. We note sales of basic iron amounting to 10,000 tons or more for delivery in second and third quarters at \$30, Valley furnace, and a sale of 2000 tons of Bessemer for second quarter at \$35, Valley furnace. The Central Steel Company, Massillon, Ohio, is in the market for 15,000 tons of basic for prompt delivery. Foundries that have iron bought on contracts made some time ago are not getting deliveries on it, and are coming in the market and buying odd lots for which they are paying from \$33 to \$35, Valley furnace. It is generally expected that the whole pig-iron market will be higher if war should be declared. Present quotations are as follows: Standard Bessemer iron, \$35; basic, \$30 to \$31; gray forge, \$29; malleable Bessemer. \$30; and No. 2 foundry, \$31 to \$32; all at Valley furnace, the freight rate to the Pittsburgh or Cleveland district being 95c. per ton.

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Billets and Sheet Bars.—The war cloud has put a new aspect on the steel market. It is predicted that on a declaration of war prices of Bessemer and open-hearth billets and sheet bars will quickly go much higher. Domestic customers would then only get such part of the output of the steel mills as the Government did not There is no trouble in selling Bessemer and openhearth billets and sheet bars at \$65 per ton at mill, or higher, but it is simply impossible to get cars to make shipments. Steel mills are therefore indifferent about taking on new business. We quote soft Bessemer and open-hearth billets and sheet bars at \$65 to \$70 per ton, maker's mill, Pittsburgh or Youngstown; forging billets, \$85 to \$90 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25.

Ferroalloys .- Prices of domestic 80 per cent ferromanganese have advanced sharply and it is now quoted all the way from \$185 to \$200 a ton, delivered. But little domestic is available, and shipments of English are held up, with the result that a decided scarcity in the supply has come. Several steel mills in this and

adjacent districts made contracts months ago for English 80 per cent ferromanganese at \$164, seaboard, but shipments are not being made and this condition is creating an active demand for fairly large lots for prompt delivery. If war should be declared there might be serious trouble in getting manganese ores, and this is also having its effect on prices. The scarcity in supply of 50 per cent ferrosilicon continues and it has sold in small lots for prompt shipment at prices ranging from \$80 up to \$100 per ton. We quote English 80 per cent ferromanganese at nominally \$164, seaboard, and domestic at \$190 to \$200 per ton, delivered. Nominal prices on 50 per cent ferrosilicon in lots up to 100 tons are \$100; 100 tons to 600 tons, \$99, and over 600 tons, \$98, all per gross ton, f.o.b. Pittsburgh, but as noted above, consumers who are short have paid much higher prices. We quote 18 to 22 per cent spiegeleisen at \$60 to \$65, and 25 to 30 per cent at \$70 to \$80, delivered; 9 per cent ferrosilicon, \$39 to \$41; 10 per cent, \$40 to \$42; 11 per cent, \$41 to \$43; 12 per cent, \$42 to \$44; 13 per cent, \$43.50 to \$45.50; 14 per cent, \$45.50 to \$47.50; 15 per cent, \$47.50 to \$49.50, and 16 per cent, \$50 to \$52; 7 per cent silvery, \$29.50 to \$30; 8 per cent, \$30 to \$31; 9 per cent, \$30.50; 10 per cent, \$31; 11 per cent, \$32, and 12 per cent, \$33. These prices are f.o.b. at furnace, Jackson or New Straitsville, Ohio, and Ashard Krault of the straits of the strain of t land, Ky., all of which have a freight rate of \$2 per gross ton to the Pittsburgh district.

Structural Material.-While no large contracts were placed in this district the past week, the new demand is reported quite active. The McClintic-Marshall Company has taken 1000 tons for a new foundry building for the General Electric Company at Schenectady, N. Y., eight small bridges for the Boston & Maine Railroad, 400 to 500 tons, and 275 tons for a subway loop in the Grand Central Station in New York. The American Bridge Company has taken about 325 tons of bridge work for the Pennsylvania Railroad, and the John Eichleay, Jr., Company, 524 tons for a new bank building at Inquiries include 6000 to 8000 tons for the Akron, Ohio. new plant of the Springfield Tire Company, Cumberland, Md., of which S. Diescher & Sons are engineers, and 3000 to 4000 tons for the new Worth steel plant at Claymont, Del. Some automobile concerns are extending their plants, and have inquiries in the market for considerable amounts of structural steel. The Carnegie Steel Company is still qubting 3.25c. at mill for beams and channels up to 15-in., with no promise of delivery, while another large maker is quoting 3.25c. to 3.50c. for delivery late in the second quarter and over the third quarter. Prices on small lots of beams and channels from warehouse range from 4c. up, depending on the quantity.

Plates.—Inquiry for steel cars is quiet, and no large orders were placed the past week. The Pressed Steel Car Company and Standard Steel Car Company are reported to be filled on contracts until about July 1, next year. Demands on the mills for plates from ship-yards are enormously heavy, and the greater part of the output of plates for this year is already under contract. We quote ¼-in. and heavier sheared plates at 3.75c. at mill, with no promise of delivery, while mills that can ship late in second quarter and in third quarter are quoting from 4c. to 4.50c. at mill for desirable orders. Small lots for fairly prompt shipment are quoted at 5c. and higher at mill.

Steel Rails.—No important orders for standard sections are reported. It is stated that the Carnegie Steel Company has no more room for standard section rails for delivery this year, and has taken a large amount of business for delivery in the first half of 1918. The new demand for light rails is quite heavy from the coal-mining companies, and mills are sold up for months ahead. We quote light rails as follows: 25 to 45 lb., \$50; 16 to 20 lb., \$51; 12 and 14 lb., \$52; 8 and 10 lb., \$53, in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard section rails of Bessemer stock are held at \$38, and open-hearth \$40 per gross ton, Pittsburgh.

Sheets .- It is confirmed that the Ford Motor Company has pretty well covered on its requirements of special grade sheets for the building of about 1,000,000 cars over the next 18 months. No figures are available as to the quantities of the different grades bought, but the company's purchases are said to have been more than double what they were this time last year, and of course the prices paid were considerably higher. current demand for sheets is strong, but not so active as in the latter part of last year. Specifications against contracts are freely coming in and prices are firm. Some mills report that on No. 28 Bessemer black sheets they are able to obtain 4.75c. and sometimes 5c. at mill for fairly prompt shipment. Consumers are well covered over the first half of this year. The output is restricted to some extent by the scarcity of steel, and shipments are held up greatly by the shortage in cars and motive power. Thousands of tons of all grades of sheets are piled up in mill warehouses awaiting cars for shipment. We quote blue annealed sheets, Nos. 3 to 8, at 4c. to 4.25c.; box annealed, one pass, Bessemer cold-rolled sheets, No. 28, 450c. to 5c.; No. 28 galvanized, 6.25c. to 7.50c.; No. 28 tin-mill black plate, 4.25c. to 4.50c., all f.o.b. mill, Pittsburgh. These prices are for carloads or larger lots, and the higher prices quoted are for reasonably prompt shipment.

Tin Plate.—The current demand is not large, but none of the mills has much to sell for the first half of this year, while several report they have practically their entire output sold up for the whole year. The export demand is heavy, and it is claimed \$8 per base box at mill for bright plate could easily be obtained if mills had it to spare. On current orders, prices range from \$7 to \$7.50 per base box at mill. We quote I. C. terne plate, 107 lb., at \$7.15 to \$7.65, and 200 lb., carrying 8-lb. coating, at \$11, the usual advances applying for heavier weights and coatings.

Shafting.—The new demand is fairly active, but mostly for small lots for prompt shipment. Large consumers are pretty well covered over the first half, and makers report specifications coming in quite freely. The Ford Motor Company is reported to have placed recently large contracts for shafting for extended delivery, the business having been divided among three or four makers. Deliveries are fairly good, some makers being able to ship out in 60 days and others in 90 to

120 days from date of order. Prices remain firm. We quote cold-rolled shafting at 20 to 15 per cent off in carload lots and 10 per cent off in less than carload lots for first quarter and first half, f.o.b., Pittsburgh, freight added to point of delivery.

Railroad Spikes and Track Bolts.—Some large Western railroads are trying to cover on their needs of spikes for delivery over second half of 1917, but several makers refuse to enter contracts for delivery beyond July 1. One Eastern road is said to have placed a contract for 12,000 kegs with two local makers for delivery in first half of this year and at the full price of \$3.40 base per 100 lb. The new demand for track bolts is active, but is almost entirely for delivery in second half, railroads being well covered for first half of this year; specifications, however, are only fair. We quote track bolts with square nuts at 4.85c. to 5c. to railroads and 5c. to 5.25c. in small lots to jobbers, base. Railroad spikes, 9/16 in. and larger, \$3.40, base; 7/16 and ½ in., \$3.50, base; 5/16 and ¾ in., \$3.75, base. Boat spikes, \$3.65, base, all per 100 lb., f.o.b. Pittsburgh.

Wire Products.-Nearly all makers of wire and wire nails have their entire output sold up for first quarter and some partly for second quarter. The market is very firm and mills are confining sales almost entirely to regular customers, owing to the crowded condition of their order books. There is an active export demand both for wire and wire nails, especially from Canada, but local makers are not taking on much export business, as they want to conserve practically their entire output over the next quarter for the domestic trade. The spring demand is expected to open up shortly, and will likely be quite heavy. Prices are very firm, but we do not hear of any further talk in the trade of an early advance. We quote: Wire nails, \$3, base, per keg; galvanized, 1 in. and longer, including large head barbed roofing nails, taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire is \$3.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$2.95; galvanized wire, \$3.65; galvanized barb wire and fence staples, \$3.85; painted barb wire, \$3.15; polished fence staples, \$3.15; cement-coated nails, \$2.90, base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to the point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven wire fencing are 53 per cent off list for carload lots, 52 per cent for 1000-rod lots, and 51 per cent for small lots, f.o.b. Pittsburgh.

Wire Rods.—There has been a great scarcity in supply of wire rods for some months, largely due to the fact that nearly all makers of rods need the greater part of their output for their own finishing mills. Recently there has been some heavy demand for high-carbon rods, rolled from acid steel, and sales have been made at \$100 and as high as \$110, at maker's mill. There is an active demand for rods from Canada, and makers could readily obtain \$75 and even \$80 per ton at mill for soft rods for shipment to that country if they had them to spare. We quote soft Bessemer, open-hearth and chain rods at \$75 to \$80, at maker's mill, Pittsburgh. For high-carbon rods, prices range from \$90 to \$110 at mill.

Iron and Steel Bars.—As noted last week, the new demand for both iron and steel bars is not so heavy as it was, and there has also been a slight falling off in specifications from some large consumers of steel bars, notably the implement trade. However, leading makers are pretty well filled up with orders for merchant steel bars for first half of this year, and the Carnegie Steel Company has the greater part of its output for all of this year under contract. Mills report the new demand for reinforcing steel bars as fairly heavy with prices ruling firm. We quote steel bars at 3c. to 3.10c. at mill for second and third quarter delivery. We quote refined iron bars at 3.25c. and railroad test bars at 3.40c. in carload lots, f.o.b. Pittsburgh.

Rivets.—The domestic demand for rivets is fairly active, but is not as heavy as the export demand. Local makers state they could readily enter large contracts for rivets for export to South America, Africa,

India and to the Orient, if they could secure cars for loading to seaboard and also bottoms. This, however, is practically impossible, and a large amount of export business is being turned down at higher than domestic prices on this account. Prices are firm, and on less than carload lots 10c. to 15c. per 100 lb. is readily paid over the usual carload price. Makers quote buttonhead structural rivets, 1/2 in. in diameter and larger, \$4.25 per 100 lb., base, and conehead boiler rivets, same sizes, \$4.35 per 100 lb., base, f.o.b. Pittsburgh. are 30 days net, or one-half of 1 per cent for cash in 10 days.

Nuts and Bolts.-Makers still report domestic demand as fairly active, but nearly all consumers have covered over first half of this year and are specifying freely against contracts. The export demand is also heavy, but inability to get cars and also bottoms is cutting off a large amount of export trade that could easily be secured at higher than domestic prices. the makers have large stocks piled in their warehouses, awaiting cars for shipment. Discounts are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 and 2½ per cent; large, 30 and 5 per

Machine bolts, h. p. nuts, small, rolled thread, 50 per cent; small, cut thread, 40 and 10 per cent; large, 35 and 5

cent; small, cut thread, av and 10 per cent; per cent.

Machine bolts, c. p. c. and t. nuts, small, 40 per cent; large, 30 per cent. Bolt ends, h. p. nuts, 35 and 5 per cent; with c. p. nuts, 30 per cent. Lag screws (cone or gimle point), 50 per cent.

Nuts, h. p. sq. and hex., blank, \$2.50 off list, and tapped, \$2.30 off; nuts, c. p. c. and t. sq., blank, \$2.10 off, and tapped \$1.90 off; hex., blank, \$2.25 off, and tapped, \$2 off. Semi-finished hex. nuts, 50, 10 and 5 per cent.

Rivets 7/16 in. in diameter and smaller, 40 and 10 per cent.

Hoops and Bands .- The new demand is only fairly active, as most consumers are covered over first quarter and some of the larger trade over first half of this year. Specifications against contracts are active, ments are held up greatly on account of lack of cars. The nominal price of the Carnegie Steel Company on steel bands is 3c., extras as per the steel bar card, and on steel hoops, 3.50c. at mill, but with no definite promise of delivery. Other mills that can ship fairly promptly are quoting 3.50c. to 3.75c. on hoops and up to 3.25c, on steel bands.

Cold-Rolled Strip Steel .- Some fairly large contracts for cold-rolled strip steel have been placed with makers for delivery in second quarter of this year at \$7 per 100 lb. at mill. The price for first quarter delivery was \$6.50 per 100 lb. The new demand is only active and mills report specifications against contracts coming in at a moderate rate. We quote cold-rolled strip steel for first quarter on contracts at \$6.50, and second quarter at \$7 per 100 lb. On current orders for reasonably prompt shipment makers quote \$7 for fair-sized quantities up to \$7.50 per 100 lb. for small lots. Terms are 30 days net, less 2 per cent off for cash in 10 days, delivered in quantities of 300 lb. or more when specified for at one time.

Wrought Pipe .- On Thursday, Feb. 1, the Wheeling Steel & Iron Company issued a new card on steel pipe showing discounts of two points, equivalent to an advance of \$4 per ton. As yet, however, none of the other pipe mills has taken similar action, still quoting the same discounts on iron and steel pipe that went into effect on Dec. 29, 1916. It is said the mills that make line pipe, 10 in. and larger, are filled up to October, if they do not take another order. A Youngstown, Ohio, mill is reported to have taken lately 400 miles of 10-in. pipe for delivery to Western gas interests, and at present there are active inquiries in the market for at least 150 miles of 12-in. and larger, plain-end, o.d. pipe. None of the mills is in position to take on more contracts for large pipe for delivery before late this year, but on butt weld sizes they can make shipments in thirty days to six weeks from date of order. None of the pipe mills is actively seeking orders for line pipe. Prices are firm, as indicated by the action of the Wheeling Steel & Iron Company, whose discounts on steel pipe are now two points lower than other mills. counts on iron and steel pipe are given on another page.

Boiler Tubes.-The large users of boiler tubes, notably locomotive and boiler shops, are pretty well covered on their needs over the first half of this year, and some through the entire year. All the makers of iron and steel tubes are practically sold up for all of this year, and on seamless steel tubing, two mills report they are sold up to July 1, 1918. Discounts are largely nominal on both iron and steel tubes, and are given on another page.

Coke.—The intensely cold weather of the last few days has added to the troubles of coke producers in getting cars and also to the railroads, and the car situation at present is probably worse than at any time With one leading coke producer only 35 for months. per cent of the cars needed was the average for all last week, some days the number running as low as 10 per cent. In cold weather car movement is slower and blast furnaces in the Pittsburgh and Valley districts are suffering greatly for lack of coke. Consumers say there is not much use in paying \$8.50 to \$9 per ton for blast furnace coke for prompt shipment, as delivery on this is not much better than on contract coke. Sales of prompt furnace coke have, however, been made in the past few days at \$9 and \$9.25 at oven. Nothing is heard of contracts for furnace coke, and it is not likely the present deplorable car situation will clear up for some time. We quote best grades of blastfurnace coke for prompt shipment at \$9 to \$9.25 per net ton at oven, and \$6 to \$7 per net ton at oven is talked of on contracts, with nothing done. Best grades of 72-hr. foundry coke are still held at \$10 to \$11 per net ton at oven for spot shipment, anywhere from \$7 to \$9 on contracts, but with nothing doing on the latter. The output of coke in the upper and lower Connellsville region for the week ended Jan. 27 is given by the Connellsville, Pa., Courier as 352,401 tons, an increase over the previous week of 4911 tons.

Old Material.—While some dealers report a slightly better tone in the local scrap market, it is not reflected in prices or in new demand, which has not shown any betterment. There is some new buying of scrap be tween dealers, but consumers are not in the market and apparently are not interested in scrap even at the prices ruling. There has been some new demand recently for low phosphorus melting stock, which is moving quite freely, and for which high prices are being Fresh demand for heavy steel scrap for openhearth melting purposes and also for borings and turnings is very dull. We note sales of scrap billet and bloom crop ends of 5000 tons or more at \$32 and \$33, delivered to consumers' mills, Pittsburgh, also 1000 tons of billet and bloom ends at \$32 and 500 tons of plate shearings at \$32.75, delivered to consumers' mills. We also note several sales of turnings, probably 800 tons at about \$12 and 500 tons of cast-iron borings at about \$12.25 per gross ton, delivered to consumers' mills. Prices for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, are nominally as follows:

Heavy steel melting scrap, Steuben- ville, Follansbee, Brackenridge, Sharon, Monessen, Midland and		
Pittsburgh, delivered		
No 1 foundry cast	19.00 to	19.50
Rerolling rails, Newark and Cam- bridge, Ohio, Cumberland, Md., and		
Franklin, Pa	27.00 to	28.00
Hydraulic compressed sheet scrap	18.00 to	
Bundled sheet scrap, sides and ends,	20.00 00	A0.00
f.o.b, consumers' mills, Pittsburgh		
district	15.50 to	18.00
Bundled sheet stamping scrap	15.00 to	
No. 1 railroad malleable stock	19.00 to	19.50
	12.50 to	
Railroad grate bars		
Low phosphorus melting stock	32.00 to	
Iron car axles	41.00 to	
Steel car axles	45.00 to	46.00
Locomotive axles, steel	47.00 to	48.00
No. 1 busheling scrap	17.00 to	
Machine-shop turnings	12.00 to	
Old carwheels	20.50 to	21.00
Cast-iron borings	12.25 to	
*Sheet bar crop ends	25.00 to	26.00
No. 1 railroad wrought scrap	23.00 to	24.00
Heavy steel axle turnings	15.50 to	16.00
Heavy breakable cast scrap	17.50 to	18.00

<sup>\*</sup>Shipping point

# Chicago

CHICAGO, ILL., Feb. 6, 1917 .- (By Wire.)

With all interests intent upon discovering indications of the effect of international developments upon the market, opinion is as yet uncrystallized and divergent. No changes in buying or selling policies have appeared, and the week opened with inquiry as general and as heavy as has been the case for some weeks Opposed to the opinion expressed by some few manufacturers that this is a time for liquidation of stocks of raw materials is the more general belief that an even greater demand for products made from steel impends. January was a month of exceptionally large shipments for the leading interest, despite the railroad congestion. Purchases of rails and rolling stock closed last week by the railroads were of no great moment. A wider activity in construction work calling for structural shapes is shown in the reports of contracts placed, a conspicuous feature being the beginning of the Pullman Company's reconstruction of its car shops. There is a steady demand for plates and sheets with only a scattering supply available for meeting these needs. Local jobbers have advanced their prices for structural steel, plates and blue annealed sheets \$3 per ton. ing of pig iron last week was largely for second-half delivery, and with an advantage of \$3 to \$4 per ton, Southern iron had the call in most of the transactions, one consumer taking 2700 tons. The fact that several stove makers were among the active buyers of the week favored the sale of high-silicon irons from the South. Prices of scrap show little change aside from the tendency toward weakness in busheling and foundry

(By Mail)

Pig Iron.—The activity in the pig-iron market, which first manifested itself in connection with buying of malleable iron, became more scattering in the last week, with interest turning principally to Southern iron. One sale of 2700 tons at a price equivalent to \$23, Birmingham, for No. 2 was made, deliveries extending through Other sales of 500 tons are noted, on the the year. same basis, for last half shipment. Offerings, also, of high-silicon Southern have been readily absorbed and a total, closely approaching 1500 tons, was placed. Sales of spot Southern are also noted, higher prices being secured in some instances by as much as \$1 per ton. Except for the competitive grades of Northern iron, the Southern product is to be had at a price advantage of from \$3 to \$4 per ton, to which fact recent sales are largely attributable. Selling of Northern iron has not been important in amount, but there is a fair inquiry in the market, including 500 tons for the St. Paul Rail-road. Charcoal-iron prices have been sharply advanced to a minimum of \$32, but in addition quotations cover a wide range, some of the larger interests quoting as high as \$35 at the furnace. Two of the principal producers have declined to quote on recent inquiries. No apparent change in the attitude of melters has been brought about by the developments of the past few days. Ferromanganese, however, has risen sharply and prices range from a minimum of \$185 to \$250, depending upon the delivery desired. For Lake Superior charcoal iron we quote delivery prices at Chicago to include a freight rate of \$1.75. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5\$33.75 to \$	35.75
Lake Superior charcoal, No. 1 34.25 to	36.25
Lake Superior charcoal, No. 6 and	
Scotch 34.75 to	36.75
Northern coke foundry, No. 1 31.00 to	32.00
Northern coke foundry, No. 2 30.00 to	31.00
Northern coke foundry, No. 3 29.50 to	30.50
Northern high phosphorus foundry 27.00 to	28.00
Southern coke No. 1 f'dry and 1 soft 27.50 to	28,50
Southern coke No. 2 f'dry and 2 soft 27.00 to	27.50
Malleable Bessemer 31.00 to	32.00
Basic	31.00
Low phosphorus 50.00 to	55,00
Silvery, 8 per cent 38.50 to	39.00
Bessemer ferrosilicon, 10 per cent 46.50 to	47.00

Rails and Track Supplies.—The placing of 10,000 tons of rails at Chicago by an eastern Ohio railroad was

an unusual feature of the week, and with about 7000 tons of rails purchased for a northern Indiana interurban line constituted the principal rail transactions. Prices of track fastenings are unchanged. Quotations are as follows: Standard railroad spikes, 3.50c. to 3.60c., base; track bolts with square nuts, 4.50c. to 4.60c., base, all in carloads, Chicago; tie-plates, \$55 to \$60, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, \$38, base; open-hearth, \$40; light rails, 25 to 45 lb., \$44; 16 to 20 lb., \$45; 12 lb., \$46; 8 lb., \$47; angle bars, 2.25c.

Structural Material.—Contracts for fabricated steel placed last week approximated 5000 tons. The Pullman Company has begun its construction program, which will ultimately provide for the rebuilding of a large part of its shops, and has placed 1000 tons with the American Bridge Company and 260 tons with the Mc-Clintic-Marshall Construction Company. The South Halsted Street Iron Works will fabricate 1450 tons for a high school building at Chicago; the American Bridge Company, 560 tons for the Oliver Iron Mining Company, and the Virginia Bridge & Iron Company 500 tons for a St. Louis & San Francisco Railroad bridge. Worden-Allen Company took the 400 tons for the Isle Royale Copper Company shops at Houghton, Mich., while other contracts in smaller amounts were distributed. Car buying in the West continues light, the desire of several of the railroads to build cars in their own shops being thwarted by the difficulty of securing materials from mill. The advance in the price of struc-tural material has had little bearing on the market, in view of the almost complete lack of steel available for sale. We quote for Chicago delivery of structural steel from mill 3.439c. to 3.689c.

Jobbers have announced an advance of \$3 per ton following the increase in prices from mill and we quote for Chicago delivery of structural steel out of store 4c.

Plates.—The high prices of plates do not seem to discourage inquiry and local mills have been declining a very large aggregate tonnage. Where quotations can be made, the mill price is seldom less than 5c., Pittsburgh, even the jobbers buying on that basis for resale at from \$5 to \$7 per ton less. We quote for Chicago delivery of plates from mill, at its convenience, 3.939c.; for prompt shipment, in widths up to 72 in., 4.689c. to 5.189c., and for wide plates, 4.939c. to 6.25c., depending upon deliveries.

Local jobbers have advanced the price of plates \$3 per ton and we quote for Chicago delivery out of stock 4.65c.

Sheets.—Trading in sheets is restricted within very narrow limitations as regards sources of supply and prices are subject to considerable variation. Inquiry continues in excess of the available material for the deliveries desired. We quote, for Chicago delivery, No. 10 blue annealed, 4c. to 4.50c.; box annealed, No. 16 and lighter, 4.50c. to 5c.; No. 28 galvanized, 6.50c. to 7c. These quotations are minimum prices for contracts. Early shipment quotations are \$5 to \$10 per ton higher.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5c.; No. 28 black, 5.15c.; No. 28 galvanized, 7.25c.

Bars.—Some of the mills have Bessemer bars to offer and are asking 3.25c. to 3.50c., Pittsburgh. Sales of bar iron and rerolled bars are being made in small quantities and at the generally uniform price of 3c. at the mill. We quote mill shipment, Chicago, as follows: Bar iron, 3c. to 3.25c.; soft steel bars, 3.189c. to 3.439c.; hard steel bars, 3c. to 3.25c.; shafting, in carloads, 20 per cent off; less than carloads, 15 per cent off.

We now quote store prices for Chicago delivery as follows: Soft steel bars, 3.75c.; bar iron, 3.75c.; reinforcing bars, 3.75c., base, with 5c. extra for twisting in sizes ½ in and over and usual card extras for smaller sizes; shafting list plus 5 per cent.

Rivets and Bolts.—A desultory sort of buying is the rule, with occasional contracting where the quantities involved are of any size. Specifications against contracts are liberal and insistent. We quote as follows: Carriage bolts up to % x 6 in., rolled thread, 40-10; cut thread, 40-2½; larger sizes, 30-5; machine bolts up to % x 4 in., rolled thread, with hot pressed square nuts, 50; cut thread, 40-10; large size, 35-5; gimlet-point coach screws, 50; hot pressed nuts, square, \$2.50 off

per 100 lb.; hexagon, \$2.60 off. Structural rivets, % to 14 in., 4.15c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 4.50c.; belier rivets, 4.60c.; machine bolts up to % x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to % x 6 in., 40-2½; larger sizes, 30-5; bot pressed nuts, square, \$3, and hexagon, \$3 off per 100 lb.; lag screws, 50.

Wire Products.—The demand for wire to maintain jobbing and retail stocks is undiminished and in the lines which have shown the greatest demand throughout the year the movement is unabated. No further change in price has been announced. We quote to jobbers as follows, per 100 lb.: Plain wire, Nos. 6 to 9, base, \$3.239; wire nails, \$3.189; painted barb wire, \$3.339; galvanized barb wire, \$4.039; polished staples, \$3.339; galvanized staples, \$4.039, all Chicago.

Cast-Iron Pipe.—The United States Cast Iron Pipe & Foundry Company was awarded the 300 tons of special fittings at Chicago. At Springfield, Ill., 1250 tons and at Minneapolis 2200 tons are still to be let. Inquiries for a variable amount with a minimum of 250 tons for Columbus, Ohio, and 350 tons for Rockford, Ill., constitute the principal new business in sight. We quote as follows, per net ton, Chicago: Water pipe, 4-in., \$44.50; 6-in. and larger, \$41.50, with \$1 extra for class A water pipe and gas pipe.

Old Material.—The leading buyer of heavy melting steel came into the market last week for a quantity of heavy melting and shoveling steel scrap, buying approximately at the current rate but strengthening the price somewhat in consequence of its activity. The price of wrought scrap has been strongly held despite the limited buying but the market for busheling and pipes is noticeably softer. Foundry scrap is also somewhat weaker. Some of the principal users of scrap have indicated an intention to liquidate stocks. Railroad offerings last week were conspicuously small, the only lists of importance being from the Pennsylvania lines and the Pere Marquette. We quote for delive; y at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton		
Old iron rails	\$27.00	to \$28.00
Relaying rails	30.00	to 31.00
Old carwheels	18.50	to 19.50
Old steel rails, rerolling	27.00	to 28.00
Old steel rails, less than 3 ft	24.50	to 25.00
Heavy melting steel scrap	21.25	to 21.75
Frogs, switches and guards, cut apart	21.50	to 22.00
Shoveling steel	18.50	to 19.00
Steel axle turnings	13.50	to 14.00

Steel axle turnings	13.50 to	14.00
Per Net Ton		
Iron angles and splice bars	26.50 to	\$27.00
Iron arch bars and transoms	27.00 to	27.50
Steel angle bars	20.50 to	21.00
from car axies	34.00 to	35.00
Steel car axles	34.00 to	35.00
10, 1 railroad wrought	23.50 to	
Talifoad Wrought	22.50 to	
Cut forge	22.00 to	
a spea and nues	13.50 to	
No. 1 busheling	16.25 to	16.75
No. 2 busheling	12.50 to	
Steel knuckles and couplers	22.50 to	
Steel springs	23.50 to	
No. 1 boilers, cut to sheets and rings	13.50 to	
Boiler punchings	18.50 to	
Machine-shop turnings	31.00 to	
Cast borings	9.25 to 9.00 to	
No. 1 cast scrap	15.00 to	
Stove plate and light cast scrap	11.50 to	
Grate bars	12.50 to	
	19 50 50	
Railroad malleable	17.25 to	
Agricultural malleable	14.75 to	15.25
	* x : 1 0 00	AUSEU

### Philadelphia

PHILADELPHIA, PA., Feb. 6, 1917.

International events may have caused some hesitancy in buying, but it is hardly perceptible. A large mill last week booked more specifications in plates and shapes than for some time. A company specializing in plates reports no change whatever, the demand being such that it continues to turn business away. This maker sold a sizable tonnage of boiler steel, Lloyd's specifications, but no marine test, at 8c., mill. Domestic ferromanganese is stronger, makers now asking \$250, furnace, for 80 per cent. Fifty per cent ferrosilicon is practically unobtainable. An eastern Pennsylvania consumer, whose deliveries of basic pig iron

were short, purchased 5000 tons of Northern and 3000 tons of Virginia, at a minimum price equivalent to \$30.50, Philadelphia. The old material market is quiet and somewhat easier. A local steel company bought heavy melting steel scrap at \$20.25. The coke market is uncertain and a troublous subject to furnace operators.

Pig Iron.-An eastern Pennsylvania consumer of basic, whose deliveries have not been sufficient for his needs, closed the past week for 5000 tons of Northern basic for which about \$30.50, delivered, was paid, and for 3000 tons of Virginia basic for which the price was about \$32, delivered. Standard low phosphorus is exceedingly strong at \$56 to \$58, at which levels sales have been made. For low phosphorus containing copper \$55, furnace, is quoted. Makers of armament and projectiles are seeking assurances that they will be supplied with larger quantities should occasion arise. makers, however, are so heavily sold ahead that they can only promise to increase their shipments in the desired direction by cutting down deliveries intended for export and for consumption by domestic industrial com panies. Bessemer, for export to Canada, has been sold at \$36, furnace, about equal to \$38, Philadelphia. Specialties are active, but new business in foundry grades continues confined to small spot sales at full prices. Nowhere is there any suggestion of concessions; on the other hand, resale iron appears to have been cleaned up. Eastern Pennsylvania No. 2 X is quoted at \$30 to \$32, furnace, the freight rates in most cases bringing the delivered price to near \$32. First half Virginia No. 2 X is quoted at \$27.50 to \$28, furnace, taking a freight rate of \$2.75 to this city. Another furnace quotes \$29, furnace. One maker quotes \$27, furnace, or \$29.75, Philadelphia, for last half, and another \$27.75, furnace, or \$30.50, Philadelphia, for the same delivery. The Virginia furnaces, in fact all furnaces, are seriously affected by the freight situation, particularly in New England. One or two railroads represent to shippers that there is no embargo on their lines, yet they have not sufficient locomotives to haul the cars delivered to them by connecting roads, and the latter therefore refuse to accept shipments for delivery to these roads. Meanwhile all consumers are pressing hard for deliveries. Quotations for standard brands delivered in buyers' yards, prompt shipment, range about as follows:

Eastern	Pa.	No.	2 3	f	un	dr	y.		 . 8	31.00	to	\$32.00
Eastern	Pa.	No.	2	pla	in.					30.50	to	31.50
Virginia	No.	2 3	C fo	un	dry			 		30.50	10	31.50
Virginia	No.	2 1	olair	1			× 0			30.00	to	31.00
Gray for												
Basic Standard												

Iron Ore.—Arrivals of foreign ore at this port in the week ended Feb. 3 consisted of 4850 tons from Cuba and 3696 tons from Spain.

Ferroalloys.—Until last Saturday, domestic makers of 80 per cent ferromanganese quoted \$200, furnace, but on Monday they advanced their price to \$250, furnace. Foreign material, in view of the great uncertainty which prevails with regard to future deliveries, is purely nominal at \$164, seaboard, for delivery in the last three quarters of the year. Cables from the other side are very irregular. Last week 1193 tons arrived here from England. Spiegeleisen is strong around \$65 for 20 per cent. Fifty per cent ferrosilicon is well nigh unobtainable, and small lots have brought \$210, Pittsburgh. Bessemer ferrosilicon. 11 to 12 per cent, is about \$43, furnace, or \$46.44, Philadelphia.

Plates.—The demand is fully sustained, and a point has been reached where sales agents are instructed to submit all important inquiries to the mill, and thereafter quotations are given only after careful consideration. A good-sized order for boiler steel conforming to Lloyd's specifications, but not subjected to marine test, was taken at 8c., mill. The week was a heavy one for material designed to enter locomotives. One interest has placed orders for three steamers, requiring about 6000 tons of plates, and one other boat, requiring 1300 tons, has also been ordered, the material required to be delivered in 1918. Quotations for tank plates range from 4.909c. to 5.159c., Philadelphia. Ship plates are quoted at 6.159c., Philadelphia.

Structural Material.-A machine-shop building for the League Island Navy Yard, Philadelphia, requiring 3400 tons, is reported to have been awarded to the Gormley Company, a contracting firm of Washington, The Navy Department has asked for bids to be opened Feb. 12 on two crane runways requiring 7500 tons for the Norfolk Navy Yard, similar to the runway at the League Island yard, contract for which was awarded to the American Bridge Company. Bids were opened yesterday in this city for three sections of the local subway. The Keystone Construction Company was low bidder on two sections, and Smith, Hauser & MacIsaacs on a third section, the total requirement being 7800 tons. The Pennsylvania Railroad is placing orders for several small bridges. Quotations are strong, the minimum being 3.659c., Philadelphia, with 3.909c. obtainable for small lots.

Billets.—Sales of forging billets have been made at \$85, mill. Soft open-hearth rerolling billets range from \$60 to \$65, mill, but the mills have few to offer.

Bars.—Some makers have not gone heavily into the second quarter on steel bars and their quotation for that delivery is uncertain. While 3.409c., Philadelphia, remains the nominal minimum, business is being done at 3.659c. Iron bars are unchanged at 3.159c., Philadelphia, carload lots.

Sheets.—The demand continues good, and makers whose production is near the 100 per cent mark find an easy outlet for all they can roll. The minimum quotation for No. 10 blue annealed is 4.659c., Philadelphia.

Coke.—Spot furnace coke ranges from \$9 to \$9.25 per net ton at oven, with the minimum difficult to find. Contract furnace is nominally \$6 to \$8.50. Prompt foundry ranges from \$10.50 to \$12 per net ton at oven, the higher figure having been paid for Virginia spot coke. Contract foundry ranges from \$7.50 to \$8.50. Freight rates from the principal producing districts are as follows: Connellsville, \$2.05; Latrobe, \$1.85, and Mountain, \$1.65.

Old Material.—The market continues quiet, although it has been more active than in the preceding week. More would be doing were it not for uncertainty as to the future. Sales of heavy melting steel have been made at \$20.25. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

No. 1 heavy melting steel \$20.00	to	\$20.50
Old steel rails, recolling 30,00	to	31.00
Low phos, heavy melting steel scrap, 30.00	to	32.00
Old iron and steel axles (for export). 43.00	to	45.00
Old iron rails 28.00	to	29.00
Old carwheels 20.50	to	21.00
No. 1 railroad wrought 25.00	to	26.00
Wrought-iron pipe 17.00		18.00
No. 1 forge fire 15,00		
Bundled sheets 15.00		16.00
No. 2 busheling		14.00
Machine-shop turnings 12.50		13.00
Cast borings 13.50		14.00
No. 1 cast 20.00		21.00
Grate bars, railroad 15.50		16.00
Caraca and a second a		
Railroad malleable 17.50	LO	18.00

#### Cleveland

CLEVELAND, OHIO, Feb. 6, 1917.

Iron Ore.-While Cleveland ore men agree that there is likely to be a shortage of Bessemer ore this year, they think that it will be much less than 3,500,000 tons the amount given in the estimate of one ore firm that has canvassed the situation. Their prediction of a shortage is based on the assumption that the production of Bessemer pig iron will be as large this year as in 1916, and they expect that with the foreign demand the Bessemer production will keep up to that of last While there will not be large stock piles of vear. Bessemer ore in the old ranges to draw on as in 1916, this will be partly offset by the output of several small new properties that have been opened up and will ship ore the coming season. Should a scarcity of Bessemer ore develop, furnaces can piece out in their mixture with low phosphorus non-Bessemer ore, although the supply of the latter ore is not large. In spite of the heavy buying, one Cleveland firm reports that it can still sell a round tonnage of Bessemer ore for 1917

delivery. An Eastern inquiry has come out for about 125,000 tons of Bessemer ore, this being from a furnace that will supply a portion of the pig iron in the last Morgan purchase for export. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, \$5.95; Mesaba Bessemer, \$5.70; old range non-Bessemer, \$5.20; Mesaba non-Bessemer, \$5.05.

Pig Iron.—The market is not very active, but prices are firm. A scarcity is reported of foundry, malleable and basic grades because consumers are unable to secure shipments as required on contracts on account of the car situation, and as a result there is considerable inquiry for small lots for prompt shipment. foundries in this territory have come to market in the past few days with inquiries for first half contracts, but decided because of the present high prices to defer buy. ing until a later period. One consumer in the Central West is in the market for 5000 tons of malleable for March-May shipment, having taken chances with the market and postponed buying when prices were lower, A new foreign inquiry is out for 10,000 tons of any grade of iron. Prices on foundry iron are firmer in the Valley, where it is claimed that \$33 is now the minimum quotation for last-half contracts. One interest is asking \$36 to \$37 for prompt shipment foundry iron. Some small sales of Southern iron are reported to consumers that are taking this iron in preference to Northern grades because of lower prices. Quotations on Southern iron range from \$23 to \$25 Birmingham. Virginia foundry iron is quoted at \$28 at furnace for spot shipment and contracts. We quote, f.o.b. Cleveland, as follows:

Bessemer	***						* *				 		* *	\$39.95
Basic														
Northern														
Southern														
Gray forg	e								* *	× e.	 			29.95
Ohio silve														
Standard	low	pi	108.	. V	all	ey	fu	irn	ac	10.	50.	00	to	51,00

Coke.—It is reported that some of the leading producers have about decided to name \$6 per net ton at oven as the price for foundry coke contracts for the last half and for a 12-month period from July 1. Foundry coke for prompt shipment is somewhat firmer, and sales have been made at \$11 for standard Connells-ville coke. Conditions at the ovens in respect to shipment appear to be getting worse.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts continue quite heavy, but there is not much new business, as most consumers are under contract. The demand for rivets continues active. Two large orders were placed by Eastern shipyards with a Cleveland manufacturer the past week. Prices are firm at 4.25c., Pittsburgh, for structural and 4.35c. for boiler rivets. Bolt and nut discounts are as follows:

Common carriage bolts, % x 6 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40 and 2½; larger of longer, 30 and 5. Machine bolts with h.p. nuts, % x 4 in., smaller or shorter, rolled thread, 50; cut thread, 40 and 10; larger or longer, 35 and 5. Lag bolts, cone point, 50. Square and hexagon h.p. nuts, blank, \$2.50 off the list; tapped, \$2.30 off. C.p.c. and t. hexagon nuts, all sizes, blank, \$2.25 off. tapped, \$2.00 off. Cold pressed semi-finished hexagon nuts.

Finished Iron and Steel .- The threatened war with Germany has had little effect on the market, although in a few cases it has caused prospective buyers to defer New demand in most lines is the placing of orders. rather light. The car situation shows no improvement, and is causing a curtailment of the output in most plants. The demand for plates is fairly active, but mills that are holding for top-of-the-market prices are book ing only a moderate tonnage. We note the sale of 1400 tons of plates for building tanks for tank cars. Plates are firm at 5c. to 5.50c., Pittsburgh. Hoops are still very scarce, and a large maker has withdrawn from the market on this product. Structural material is in light demand, but the call for hard steel bars for building work continues active. These are quoted at 3c. to 3.25c., Pittsburgh. Some of the Ohio sheet mills would like to purchase sheet bars for prompt shipment, their supply being curtailed by the inability of mills with which they have contracts to make shipments, but few if any are available. The demand for sheets is quieter, and prices are unchanged. We quote sheets at 4.50c. to 5.50c., Ohio mill, for No. 28 black; 4.25c. to 5c. for No. 10 blue annealed, and 6.50c. to 7.50c. for No. 28 galvanized. Bar iron is unchanged at 3c. to 3.10c., Cleveland. Warehouse prices have been advanced \$3 per ton on steel bars, plates, and structural material, and \$5 on hoops and blue annealed sheets. We quote new warehouse prices at 4c. for steel bars under 2 in. in diameter, 4.50c. for over 2 in., 4.10c. for structural material, 4.75c. for plates, 5c. for hoops and 5c. for blue annealed sheets. The demand from warehouse is quite active.

Old Material.—There was some activity between dealers late in the week but practically no demand from the mills. The developments in the war situation have brought the market almost to a standstill. Dealers generally are unwilling to buy or sell, being uncertain in what direction the price tendency will be. Scrap sold last week by the New York Central Railroad is understood to have brought good prices. Local sales of heavy melting steel have been made to dealers at \$12. Busheling, which has been quoted nominally at \$18, is firm and some dealers are asking higher prices. We quote, f. o. b. Cleveland, as follows:

Per Gross Ton	
Steel rails\$21.00 to \$1	1.50
Steel rails, rerolling 27.00 to 2	88.00
Steel rails under 3 ft 26.00 to 2	26.50
Iron rails 28.00 to	28.50
Steel car axles 47,00 to 4	18.00
Heavy melting steel 22.00 to :	22.50
	00.05
	38.00
	15.50
Railroad malleable 20,50 to 3	21.00
	17.00
	15.00
Per Net Ton	
Iron car axles\$44.00 to \$	15.00
Cast borings 9.75 to 1	10.00
Iron and steel turnings and drillings. 9.50 to	975
	18.50
No 1 railroad wrought 24.00 to	25.00
	18.25
	13.25
	13.25

# Cincinnati

CINCINNATI, OHIO, Feb. 7, 1917-(By Wire).

Pig Iron.-War rumors afloat have not had any effect on the market as yet. Inquiry is still light and sales are correspondingly so, both conforming with the records of the past four weeks. Foundries in all districts are short of iron that should be delivered in the first quarter. The railroad situation became especially serious last week on account of severe weather conditions, but to-day shipments are moving at a better pace. Virginia furnaces lately sold some foundry iron in this territory for first quarter shipment, in which sales were 500 tons each to Indiana and Central Ohio melters. Other smaller sales are reported in Ohio. A central Ohio consumer bought 1500 tons of low-phosphorus iron for delivery before Oct. 1. Southern foundry iron sales include two in central Ohio, with a total of 800 tons for last-half shipment. A general inquiry is out for 1000 tons of basic for a northern Ohio user for first-quarter delivery. Nearby basic consumers who have not covered for the entire year have made no open move to contract just now. little malleable is available for prompt shipment, and the inquiry is light. High-silicon irons are in better demand, but southern Ohio furnaces have full order books for the next four months. A small lot of 15 per cent Bessemer ferrosilicon was sold last week at \$60, at furnace. We quote Southern No. 2 foundry at \$24 to \$25, Birmingham, for first-half shipment and around \$23 for last half. Northern foundry, malleable and basic are firm at \$30, Ironton, for any shipment this year. Virginia No. 2 X ranges from \$28 to \$29, at furnace. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.\$		
	25.90 to	
	25.40 to	
Suthern coke, No. 4 foundry	24.90 to	25.40
Southern gray forge	24.40 to	
lalo silvery, 8 per cent silicon	39.26 to	41.26
Southern Ohio coke, No. 1		31.76
Southern Ohio coke, No. 2		31.26
Southern Ohio coke, No. 3		30.76
Southern Ohio malleable Bessemer		31.26
Basic, Northern		31.26
Superior charcoal	30.20 to	31,20
Indard Southern cormheel	28 90 10	29.40

### (By Mail)

Coke.—Several of the southern Ohio furnaces have bought Solvay by-product coke for future shipment, and representatives of the Connellsville, Wise County and Pocahontas districts have taken some contract business in foundry coke. Maximum prices have been obtained on carloads of foundry coke that could be diverted. Available prompt furnace or foundry coke brings all the way from \$9 to \$12.50 per net ton at oven. Contract prices on furnace coke are from \$5.50 to \$6.50, and on foundry coke \$6 to \$8.50.

Finished Material. — The mill price of sheets is strong around 5.15c, for No. 28 black and 7.15c, for No. 28 galvanized, Cincinnati or Newport, Ky. There is considerable business in sight, but the mills are making a special effort to take care of their old customers. Local warehouse quotations on sheets are now on about the same basis as the local mill prices, but stocks are Some structural material is hard to obtain, but the situation as to nearby shipment has been relieved on account of the severe weather checking building opera-Contractors are looking for an excellent spring and summer business. Local store quotations are firmer and we quote from stocks as follows: Wire nails, \$3.40 to \$3.50 per keg base; barb wire, \$3.40 per 100 lb.; steel bars, 3.85c. to 3.90c.; round head rivets, 4.50c. to 4.60c.; No. 10 blue annealed sheets, 4.85c. to 4.90c.; rounds and squares, 2-in. and over, 4.45c. base; plates, 4.70c.

Old Material.—The market has not shown any weakness, except on those grades of scrap that are shipped into territory affected by the railroad freight embargoes. The local demand is good and the foundries are mixing more scrap in their cupolas than ever before. The following are dealers' prices, f.o.b. at yards, Cincinnati, and southern Ohio:

	24.25 to 24.75 27.75 to 28.25 24.25 to 24.75 20.25 to 20.75
Railroad cast No. 1 machinery cast Burnt scrap Iron axles Locomotive tires (smooth inside) Pipes and flues Malleable cast	21.00 to \$21.50 6.50 to 7.00 6.50 to 7.00 15.75 to 16.75 17.50 to 18.00 9.75 to 10.25 32.50 to 33.00 27.00 to 27.50 13.25 to 13.75 14.75 to 12.25

#### Buffalo

BUFFALO, N. Y., Feb. 5, 1917.

Pig Iron.—No large amount of iron of local production seems to be for sale in this district for delivery over the remainder of the year, and very little available even for small orders. Practically the only iron obtainable here now is from Virginia and Southern furnaces. Even higher prices than those quoted in the current schedule could not bring out any Buffalo district iron, as furnaces seem to be absolutely sold up. Production is restricted by delays in receipts of raw materials and the extremely cold and stormy weather; and shipments to consumers are retarded and curtailed by embargoes and car and locomotive shortage. We quote as follows on local iron for first quarter and first half delivery, f.o.b. furnace, Buffalo:

Titleb allies													£	
High silice	311	16.635	128	2		0.7		*	 	Α.	= B	\$99.00	EO	\$30.00
No. 1 fou														
No. 2 X f	our	Kiry	1									35.00	to	35.50
No. 2 plai	n .								 			35.00	to	35.50
No. 3 four														
Gray forge														
Malleable														
Basic														
Bessemer														
Charcoal,													-	-0.00
alvsis													to	36.00

Finished Iron and Steel.—Transportation conditions are still absorbing the attention of mills and customers, and a great deal of time and effort is spent in tracing shipments. The congestion at Buffalo remains acute, and the severe weather has reduced car movement at least one half. Consumers are not suspending ship-

ments or attempting to cancel orders previously placed because of war developments; but for the time being they are not sending in new inquiries except to a limited extent. The John W. Cowper Company, general contractor for the Schoellkopf store and loft building, Buffalo, placed the 200 tons required with the Ferguson Steel & Iron Company, Buffalo. The Binghamton Bridge Company has the 150 tons for the 4-story silk mill addition for the Keyser Silk Mill Company, Sidney, N. Y., and the Genesee Bridge Company, Rochester, has taken 100 tons for factory addition for the Garlock Packing Company, Palmyra, N. Y.

Old Material.—Producers of scrap are just as badly handicapped as consumers by the general conditions and the latter welcome the breathing spell which affords them an opportunity to get recent receipts of scrap in shape and relieve their own congestion. The little business consummated has been at prices current a week ago. Dealers' asking prices, per gross ton, f.o.b. Buffalo, are as follows:

# Birmingham

BIRMINGHAM, ALA., Feb. 5, 1917.

-Comparatively little buying is taking Pig Iron.place here. Several sales of warrant iron have been made at about \$22, and some is said to have gone at \$21, but whether the lower price was net or commission to be added is not known. No furnace iron has sold under \$23, and carload lots have brought \$25. One lot for second half delivery brought \$24 and something over. One company sold spot carload lots at \$24. The basis of \$23 for second half delivery has become still more general, the leading interest and one other having made sales at that price the past week. Offerings of iron intended for export are being made in the domestic market, ships to move the metal not being available. This and warrant iron offerings have tended to weaken furnace prices. The makers regard the market as intrinsically strong, asserting that the furnace interests may be considered as firmly established on the minimum of \$24 for spot and \$23 for the second half, a slight shading here and there being the only departure from the general rule. Customers are clamoring for deliveries and some improvement in the car situation has caused a heavier movement. One threefurnace operator shipped 10,000 tons in excess of output and several makers report a diminution in stocks. The decrease for the month should be considerable. A small amount of basic was taken at \$25 per ton. Southern consumption is at its height, all foundries being busy. We quote, per gross ton, f.o.b., Birmingham district furnaces, as follows:

No. 1 foundry	and	soft	 \$23.50 to \$25.50
No. 2 foundry	and	soft	 23.00 to 25.00
No. 3 foundry			 22.50 to 24.50
No. 4 foundry.			22.25 to 24.25
Gray forge			 22.00 to 24.00
Basic			 23,50 to 25.00
Chargon			25 00 to 26 00

Cast-Iron Pipe.—Fill-in orders for water pipe aggregated sufficient the past week to somewhat offset the absence of large ones. Two Southern municipalities contemplating large orders are hanging back on account of high prices, but, as makers cannot well make concessions, eventual contracts are expected. Flange pipe for the Southwest is in good demand, and is made in quantities at the North Birmingham plant of the United States Cast-Iron Pipe & Foundry Company. The Chattanooga and Anniston plants of this company

will share with the Bessemer works in the execution of the 65,000-ton Argentine order. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., \$39; 6-in. and upward, \$36, with \$1 added for gas pipe.

Coal and Coke.—These may be considered bottom prices on standard beehive coke, per net ton, f.o.b. Birmingham district ovens: For old customers, forward contracts, \$7; new customers, forward contracts, \$7.50. For old customers, spot, \$9.50; for new customers, spot, \$10.50. Two lots of 1500 tons each, extending over a period of nine months, for old customers in the Southwest, were booked at \$7. Steam coal has settled around \$2.50 to \$3.50 at mine for spot and \$2 on contracts, the latter being held back, however, as long as possible in the hope of lower prices.

Old Material.—The scrap market is very weak, which some authorities attribute to the war scare and the slump in the stock market. Recent transactions were not large in volume. We quote, per gross ton, f.o.b. Birmingham district yards, as follows:

Old	steel	axles										6		\$35.00 to \$36.00
Old	steel	rails.				2							2 5	 17.00 to 18.00
No.	1 wro	ought.		x - 8		*			-10	*	*	*		 17.00 to 18.00
														14.00 to 14.50
No.	1 ma	chiner	у.			*	2	 					 	 16.50 to 17.00
														13.00 to 13.50
Tran	n car	wheel	g .										 	 12.00 to 12.50
Stov	e pla	te and	li	e h	it.									 11.00 to 11.50

## St. Louis

St. Louis, Mo., Feb. 5, 1917.

Pig Iron.—Business in the last week did not reach large figures and practically all sales made were in 100-ton lots and less. High silicon irons have been stiff and were sold in small lots as high as \$46 per ton, furnace. Quotations for ferromanganese were made as high as \$250 per ton, seaboard, with the announced probability of domestic producers asking \$300 soon. The impression is that prices for pig iron will be higher rather than lower, regardless of war developments.

Old Material.—The embargoes prevailing have hindered business and have been aggravated by war developments. Neither buyers nor sellers seem willing to consider new business. All the industries are very busy in this territory melting their material and it can only be a question of a very short time when more will be needed. The only question then is the matter of ability to deliver, which will depend largely on the car situation. Lists out during the week included one of 1200 tons from the Mobile & Ohio, 600 tons from the Kansas City Southern, 200 tons from the Chicago, Peoria & St. Louis, 1500 tons from the Wabash, and 2000 tons from the Missouri, Kansas & Texas. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

cu, as zonows:		
Per Gross Ton		
Old iron rails	26.00 to	\$26.50
Old steel rails, rerolling	26.00 to	26.50
Old steel rails, less than 3 ft	27.00 to	27.50
Relaying rails, standard section, sub-		
ject to inspection	33.00 to	
Old carwheels	18.50 to	19.00
No. 1 railroad heavy melting steel		22.50
scrap	22.00 to	
Heavy shoveling steel	19.00 to	
Ordinary shoveling steel	17.50 to	
Frogs, switches and guards cut apart	22.00 to	-
Ordinary bundled sheet scrap	13.50 to	14.00

Per Net Ton		
Iron angle bars	\$26.00 to	\$26.50
Steel angle bars	21.00 to	21.50
Iron car axles	34.00 to	
Steel car axles	34.00 to	
	27.50 t	
Wrought arch bars and transoms	23.00 t	
No. 1 railroad wrought		
No. 2 railroad wrought	21.50 t	
Railroad springs	22.50 t	
Steel couplers and knuckles	23.50 t	0 24.00
Locomotive tires, 42 in. and over,		00.00
smooth inside	29.00 t	
No. 1 dealers' forge	17.50 t	
Cast iron borings	8.50 t	
No. 1 busheling	15.50 t	
No. 1 boilers, cut to sheets and rings.	13.00 t	0 13.50
No. 1 railroad cast scrap	14.00 t	0 14.50
Stove plate and light cast scrap	10.00 t	0 10.50
Railroad malleable	15.50 t	0 16.00
Agricultural malleable	13.50 t	
Pipes and flues	14.00 t	
Heavy railroad sheet and tank scrap.	13.50 t	
Railroad grate bars	11.50 t	
Machine shop turnings	9.00 t	
Transit only and time turnings	12.50 t	
Heavy axle and tire turnings	12.00 0	0 70.00

Coke.—Buying continued at high prices at \$12, Connellsville and West Virginia ovens, for February de-

livery, and a considerable quantity was sold at that figure, purchases being in 150 ton lots and less. By-product coke is entirely out of the market.

Finished Iron and Steel.—Business continued on much the same basis as for weeks, with no cessation in the demand for delivery on contracts and no effort to make new contracts because of the delivery situation. In standard section steel rails two sales were reported, one of 500 tons of 75-lb. material with fastenings, and one of 20 miles of rails of the same weight with fastenings. Light rails continue in very good demand and strong. Movement out of warehouse was heavy at the prices quoted: Soft steel bars, 3.80c.; iron bars, 3.75c.; structural material, 4.05c.; tank plates, 4.70c.; No. 10 blue annealed sheets, 5.05c.; No. 28 black sheets, cold rolled, one pass, 5.55c.; No. 28 galvanized sheets, black sheet gage, 7.50c.

# New York

NEW YORK, Feb. 7, 1917.

Pig Iron.—The national preparedness program is introducing a new note and possibly a sustaining factor into the market, which for several days has given evidence of a slightly easier feeling, at least so far as steel-making iron is concerned. This latter fact is expressed in the offering of two round lots of standard Bessemer in the New York market by steel companies in the Central West at slightly over \$35, delivered at Eastern ports. The American agent of the Entente Allied governments is reported to have picked up another lot of possibly 5000 tons of standard Bessemer at \$35 seaboard, but is finding much difficulty in securing large tonnages, for which it is offering \$35 delivered on the Atlantic seaboard. A scarcity of Bessemer ore and a further sharp advance in prices of spot coke are increasing the productive cost, which lends its influence to prevent any important decline in iron prices. The recent pressure to sell Bessemer is attributed in some quarters to an accumulation, but it is pointed out that stocks of standard Bessemer on Jan. 1, in the hands of merchant furnaces, was less than 106,000 tons, and since that time stocks are understood to have been reduced 27,000 tons. One sale of a round lot of basic iron is reported to have been made by an eastern Pennsylvania furnace, but details are lacking. Foundry iron has been quiet, but a little stronger in tone. A furnace in the Lehigh Valley has taken some business at \$32 for No. 2 X and basic iron is quotable at \$31 to \$32 at eastern Pennsylvania furnaces. Foundry iron consumers in New England are well provided with stocks of pig iron and are showing only moderate interest in shipments to be made over the first half of this year. There is a heavy demand for castings at full prices, but few contracts are being placed. Few if any of the foundries are able to run over 75 per cent of capacity, although having orders equivalent to 100 per cent, because of the difficulty of securing efficient labor. Several small lots of foundry iron have been sold in the last few days, amounting to about 3000 tons, and inquiries are still in the market for 6000 tons, including 3000 tons for a stove foundry in the Hudson Valley and 2500 tons for a machinery manufacturer in New Jersey. Several new inquiries for export have been put out in the last few days, including 10,000 tons for France, made up of 5000 of Bessemer and 5000 tons of foundry grades, 3000 tons of foundry iron for Holland and small lots for Scandinavia. The Italian need of 10,000 tons of Bessemer and low phosphorus is still unsatisfied. ginia furnaces have advanced prices to \$28.50 to \$29 for No. 2 foundry and one central Pennsylvania furnace is asking an advance of \$1 per ton. The Southern market has remained steady at \$24 for No. 2, Birming-The Southern ham, for furnace iron. Most of the resale lots offering at \$23 have been absorbed. Buffalo furnaces are taking very little new business, but the largest producers have tapacity well sold. We quote at tidewater for early delivery: No. 1 foundry, \$32 to \$33; No. 2 X, \$31.50 to \$32.50; No. 2 plain, \$30.50 to \$31; Southern iron at fidewater, \$31 for No. 1 and \$29 to \$30 for No. 2 foundry and No. 2 soft.

Ferroalloys .- Prices for domestic ferromanganese have been decidedly advanced in the last week. eastern Pennsylvania producer now asks \$250, delivered, for spot or first half delivery, \$200 for the third quarter and \$185 for the last quarter. Sales of small lots have been made at \$250. It is expected that other producers will raise their prices correspondingly. A Canadian consumer has purchased 1000 tons for delivery in the last half, part of which was domestic alloy which went at \$190. The market is more active, inquiries amounting to 1500 to 2000 tons, one of which is for 600 tons, with most of the deliveries stipulated in the first half. It is believed that many consumers are finding them-selves short of material earlier than expected. The domestic output of ferromanganese in January was not less than 20,000 tons. The quotation for the British alloy is unchanged at \$164, seaboard, with practically none available for first half delivery. Receipts are said to have been very good in January. Prices last half are expected to advance. Spiegeleisen is very strong with the demand increasing. The 20 per cent grade is quoted at \$65, furnace, for early delivery with \$60 asked for the third quarter and \$55 and \$60 for the last quarter. The situation as to 50 per cent ferrosilicon is no better, though it is understood that the question of Niagara power has been relieved by the passage by Congress of a law permitting the use of more water for generating electricity. The relief which this will afford cannot be immediate because of the ice at this season of the year, and it is reported that a large producer in that district will no longer quote until the question of more power is definitely assured. Inquiry from domestic producers is very insistent from many quarters, but the amount of ferrosilicon available for early delivery is exceedingly small and anywhere from \$140 to \$200 has been paid for such needs. The contract price of \$99 to \$100, depending on quantity, has not been changed. It is stated that a Kentucky company has been unable to start its new open-hearth steel plant because of inability to secure high grade ferrosilicon.

Structural Material.—Contracts closed in the last week have not been impressive. The Pennsylvania Railroad has received bids on 600 tons of bridge work The Pennsylvania and put out new inquiries yesterday for 300 tons additional. The Boston & Maine has given an order for a small bridge in Vermont to the American Bridge Company and is still in the market for similar work. inquiries for bridges come from the Philadelphia & Reading, Seaboard Air Line and the Boston & Albany. The Southern Railroad is also expected in the market The C. & O. and the B. & O. are temporarily withholding inquiries. The New York Central closed for three bridges at Elyria, Ohio, requiring 908 tons. The Norfolk & Western has ordered a coaling station, requiring 300 tons, at Vickers, Va., from the Virginia Bridge & Iron Works. The American Bridge Company has received the official award for 5000 tons in crane runways at the League Island Navy Yard and will also furnish 3400 tons for the structural shops, if the award is made to the lowest bidder, P. F. Gormley. Pilling Brass Company, Waterbury, Conn., has placed 250 tons for two buildings with the Levering & Garrigues Company. Bids have gone in on 1200 tons for the Pierce-Arrow plant extension at Long Island City and on 1300 tons for the St. Joseph Seminary at Yonkers. The United States Government is taking bids on 500 tons for a dirigible hangar at Pensacola, Fla. New inquiries in the market include 1400 tons for a power station at Black Rock, N. Y., and 250 tons for a lamp shop at Trenton, N. J., for the General Electric Company; 500 tons for a theater at Forty-fifth Street, New York City, and a round tonnage for a railroad terminal at Jacksonville, Fla. Bids have gone in on Philadelphia subway construction calling for 25 000 tons. An open-hearth building and other work at Claymont, Del., for the Worth Steel Company calls for several thousand tons of steel. The Hudson River bridge to be built by the New York Central Railroad will require 14,000 to 20,000 tons, depending on the plans adopted. We quote mill shipments of shapes in two to five months at 3.419c. to 3.919c., New York, and late this year and in early 1918, 3.419c., New York. Warehouse shipments are now at 4.10c., New York, an advance of \$3 per ton.

Plates and Bars.-Foreign shipbuilders are actively pressing the market for large tonnages of marine shapes and plates. One contract now under negotiation is to cover the requirements of six Spanish shipyards and deliveries are wanted in 15 months. It is estimated that about 75,000 tons will be purchased if available. Japanese buyers find some difficulty in closing contracts for large amounts. One eastern Pennsylvania plate manufacturer reports offerings averaging about 10,000 tons a day for the last five days, which have been declined. Domestic demand for both tank and ship plates is heavy, and another eastern Pennsylvania mill has advanced its minimum prices to 5c. per lb. for tank and universal plates and 6c. per lb. for ship plates, More shell steel has been bought. Pittsburgh basis. Sales of billets and bars in the last few days amount to 100,000 tons, including 50,000 tons, at 41/2c., Youngstown, Ohio, for shipment to Great Britain. It is understood that this steel will replace an equal tonnage shipped by English works to Italy. Another contract for 50,000 tons of bars has been placed on practically the same basis, shipments in each case to be made over the second half of this year. The French government is urgently in the market for 400,000 tons of shell steel for this year's delivery. There are also numerous small lots of shell steel for shipment to Italy and France, including 10,000 tons of ingots and 5000 tons of slabs. An Atlantic coast shipbuilder is reported to have taken a contract for four ocean boats requiring about 16,000 tons of plates and shapes, which, it is understood, will be furnished by a Pittsburgh mill. Negotiations continue actively on six to eight more boats. We quote universal plates at 4.669c. to 5.169c., New York, ordinary tank plates at 4.919c. to 5.169c., but ship plates at 5.169c. to 6.169c., and first-half 1918 plates at 3.919c., New York. Out of store we quote 5c. and higher. quote mill shipments of steel bars at 3.169c. to 3.669c., New York, the lower price for indefinite delivery and the higher for small quantities in, say, three months. We quote mill shipments of bar iron at 3.169c., New Out of warehouse iron bars are 3.70c., and steel bars are now 4c., New York.

Railroad Equipment .- Domestic railroads are finding unusual difficulty in placing orders for standard section rails for this year's delivery. One domestic road, in urgent need of 4000 tons for July, August, September and October shipment, is unable to place the order because mill capacity is fully sold for all the year. Several large foreign contracts are pending, one of which is expected to be closed next week. The French government asks for 150,000 tons of heavy rails and 20,000 tons of medium sections for delivery in the next 15 months. Spanish railroads are in the market for 300 light cars. The Interborough Rapid Transit Company is about to place an order for 400 cars and contracts for the axles and wheels required are under active negotiation.

Cast-Iron Pipe.—Binghamton, N. Y., opens bids to-day on 120 tons of 6 and 12 in. Buffalo will open bids Feb. 13 on 600 tons of 3 to 16 in. Rochester will open bids in March on 10,000 tons of 37 in., with alternate bids on steel pipe, to lay 8 miles. Export inquiries are in this market for India for 9 miles, or about 2000 tons, of 12 in., and from Chile for 3000 to 4000 tons of 8 to 12 Municipal lettings generally are few and far apart. Private buying is proceeding moderately, with the volume considerably under what it was in the corresponding time in January. Prices are firm. Carload lots of 6 in., class B and heavier, are quoted at \$41.50 per net ton, tidewater, with class A and gas pipe taking an extra of \$1 per ton. Robert Wetherill, Chester, Pa., has been appointed receiver for the Standard Cast Iron Pipe & Foundry Company, whose plant is at Bristol, Pa. It is understood that the company will be reorganized.

Old Material.—A limited volume of business is reported by dealers. Some heavy melting steel scrap has been sold through local brokers for use in a steel plant at Wilmington, Del. Iron rolling mills are taking

various kinds of stock for their purposes, but are not buying in large quantities nor for future shipment. The export demand for heavy melting steel scrap is still a feature. Brokers quote buying prices as follows to local dealers and consumers, per gross ton, New York:

**		
Heavy melting steel scrap (for east-		
ern Pennsylvania shipment)	\$17.50 to	\$18.00
Old steel rails (short lengths) or		
equivalent		19,00
Relaying rails		38.00
Rerolling rails	27.00 to	27.50
Iron and steel car axles (for export).	43.00 to	43.50
No. 1 railroad wrought	22.00 to	23.00
Wrought-iron track scrap	21.00 to	21.50
No. 1 yard wrought, long	19.00 to	19.50
Light iron (nominal)	4.50 to	5.00
Cast borings (clean)		
Cast bornigs (Clean)	10.00 (0	11.00
Machine shop turnings		10,50
Mixed borings and turnings (nom-		
(nal)	9.00 to	9.50
Wrought pipe (not galvanized or		
enameled)		15 00
Control of the contro	40.00 00	1.00,000

Cast scrap is in better demand and good prices are being obtained from the larger foundries. The prices given below represent those paid by consumers who are purchasing in good quantities, it being understood that the foundries in New York City and Brooklyn are able to secure small lots from nearby dealers at \$1.50 to \$2 less per gross ton:

																						\$21.00
No.	2	cast							0.			2			0	0				18.50	to	19.00
																						14.00
																						14.00
																						20.50
Mal	le	able	CE	18	t	(1	B	Łĺ	Ìχ	0	a	ď	)						-	18.00	to	18.50

# British Steel Market

## Pig-Iron Demand Stronger-Tin-Plates Lifeless -American Steel High

LONDON, ENGLAND, Feb. 7, 1917 .- (By Cable).

The forward demand for pig iron is increasing and the tone is firm but exports are still restricted. tin-plate market is lifeless. American 4-in. billets are nominal at \$95, c.i.f. Liverpool, and freight difficulties are hindering business. Wire rods are being offered at f.o.b. New York. Solvent naphtha is quoted at 2s. 2d., with ammonium sulphate at £19. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 27s. 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £19 5s. Hematite pig iron, f.o.b. Tees, 142s. 6d. Sheet bars (Welsh) delivered at works in Swansea Val-

ley, £15 5s. nominal.

Ferromanganese, £34 to £36 and upward. Ferrosilicon 50 per cent, c.i.f., £29 10s.

#### Manganese Ore Imports in 1916

Manganese ore imports into the United States passed the half million mark with the November imports of 31,225 gross tons. The total for the 11 months to Dec. 31,225 gross tons. 1, 1916, is 526,525 tons. This is more than the combined totals for the 11 months of 1915 and 1914, which were 251,508 tons and 256,871 tons, respectively. largest imports last year were 81,942 tons in July and the smallest, 8685 tons in February, with a monthly average of 47,866 tons to Dec. 1. The British imports for the same 11 months were less than those of the United States, or 419,604 gross tons. The value of the British imports is given as nearly \$11,000,000, while that of the larger imports to the United States is only \$7,948,967.

#### British Imports of Manganese Ore

Manganese ore imports into Great Britain in December, 1916, were only 19,905 gross tons. In November they were 32,850 tons. The total for 1916 was 439,509 tons, against 372,724 tons in 1915. The contrast with normal times is shown by the total for 1913, which was The contrast in values is also striking, 601.177 tons. that for the 1916 imports being placed at £2,315,644 and for the 1913 at £1,295,113. The valuation last year was nearly twice that for 1913, with the imports only a little more than half the 1913 imports.

# Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 b.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Louis, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c; Birmingham, Ala, 45c. Denver, pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 83.6c., minimum carload, 36,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum. mum carload, 50,000 lb.; structural steel and steel bars, 80c., minimum carload, 40,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material.-I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zees 3 in. and over, 3.25c. to 3.50c. Extras on other shapes and sizes are as follows:

	Cents per	b.
1	I-beams over 15 in	e
-		

Plates.-Tank plates, 1/4 in. thick, 6 in. up to 100 in. wide, 3.75c. to 5c., base, net cash, 30 days, or ½ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality	its per lb.
Tank steel	
Pressing steel (not flange steel	
Boiler and flange steel plates.	
"A. B. M. A." and ordinary fir	
Still bottom steel	 
Locomotive firebox steel	

Marine steel, special extras and prices on application.
Rectangular, ¼ in. thick, over 6 in. wide to 100 in. wide. Base Lighter than ¼ in., to 3/16 in., up to 72 in. wide 10 *Lighter than ¼ in., including 3/16 in., over 72 in. to 84 20 *Lighter than ¼ in., including 3/16 in., over 84 in. to 96 . 30 *Lighter than ¼ in., including 3/16 in., over 96 in. to 100 40 *Lighter than ¼ in., including 3/16 in., over 96 in. to 100 40 *Lighter than 3/16 in., including No. 8, up to 72 in. wide

						W	idth	E	x	tr	as	3													
Over	100	in.	to	110	in.	ine	lusi	ve.									6							0	.0
CASEL	1 1 11	113.	LO	115	133.	inc	11181	WA.																	.1
Over	120	in.	to	120	in.	inc	lusi	ve.	0	0 0	0	0. 0				0 0							0.	0	.1
O. s.c.l.	160	111.	EER	130	171.	IBC	1111811	ve.																	5
Over	130	in						00		0 0			0					0.0	0	0.0					1.0
						Le	nati	h 1	E a	cti	ra	8													
Univ	ersa	l pl	ate	s 80	ft.	lon	Cr. 111	2 4	~ 1	0.0	4	4	10	on	gr.										.0
																									.1
CHIV	ersa	ı pı	ate	s 10	0 f	i. lo	ng	up	te	0	11	10	Í	t.	le	n	g		0	0. 6	. 9	0	0	0	.2
							445.																		

trained plates 90 It. long up to 100 It. long	.1
Universal plates 100 ft. long up to 110 ft. long	.20
Cutting Extras	
No charge for made and a state of the state	
No charge for rectangular plates to lengths 3 ft. and over.	
	.2
	.5
	.5
Circles 2 ft in diameter to 100 in	
Circles 3 ft. in diameter to 100 in.	.3
	.3
	.4
	.4
	.5
	.8
Circles and 100 In. (width extra)	.3
Circles under 3 ft., to 2 ft., inclusive.	.5
Circles under 2 ft., to 1 ft., inclusive.	.8
Circles under 1 ft	.8
Half circles take circle extras.	. 539
Sketches not over fire extras.	
Sketches not over four straight cuts, inc. straight taper	.1
Sketches having more than four straight cuts, inc. straight taper	.2
Plates sheared to a radius take complete circle extras.	

·Including extra for width.

Wire Rods.-Including chain rods, \$75 to \$80.

Wire Products,-Prices to jobbers effective Nov. 27: Fence wire Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, \$2.95; galvanized, \$3.65. Galvanized barb wire and

staples, \$3.85; painted, \$3.15. Wire nails, \$3. Galvanized nails, 1 in. and longer, \$2 advance over base price; shorter than 1 in., \$2.50 advance over base price. Cement-coated nails, \$2.90. Woven wire fencing, 53 per cent off list for carloads, 52 off for 1000-rod lots, 51 off for less than 1000-rod lots.

Wrought Pipe.-The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from Dec. 29, 1916, all full weight:

	Butt	Weld	
Inches Steel	lack Galv.	Inches Black	Galv.
16, 14 and 36 12 34 to 3	61 4636	16 and 14	19 20 33 40
	Lap	Weld	
2 ½ to 6	57 441/2 60 471/2 57 431/2 471/2	1 1/4 40 1 1/2 46 2 47 2 4/5 to 4 49 4 1/5 to 6 49 7 to 12 48	25 32 33 36 36 35
		ind Drifted	
1 to 3, butt 2, lap 2½ to 6, lap	62 4834 55 4234 58 4534	34 to 1 ½, butt. 49 1 ¼, lap 35 1 ½, lap 41 2, lap 42 2 ½ to 4, lap 45	32 19 26 27 30
18, ¼ and 38 12, 34 to 1½ 2 to 3	53 35 1/2 58 45 1/2 62 49 1/2	strong, plain ends 14, 14 and 34 46 12	29 38 40
Lap	Weld, extra	strong, plain ends	
2 to to 4. 4 to 6. 7 to 8. 9 to 12.	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	27 33 36 39 38 32 27
Mr. Alex Yearnes A	in his house two do	on additional 5 non con	r in ml-

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe. On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to Jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes .- Discounts on less than carloads, freight to be added, effective from Nov. 1, 1916, except 3 to 41/2 in. steel from Nov. 20, are as follows:

Lap Welded Steel	Standard Charcoal Iron
1½ in	1 1/2 in
1% and 2 in	1% and 2 in
2 1/4 in	2 1/4 in
21/2 and 2% in	2 1/2 and 2 3/4 in
3 and 31/4 in	3 and 31/4 in
31/2 to 41/2 in	31/2 to 41/2 in44
5 and 6 in45	5 and 6 in
7 to 13 in42	1 7 to 13 in

Locomotive and steamship special charcoal grades bring higher prices.

1% in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.-Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

Blue Annealed Sheets 

28 Bessemer black sheets	
Box Annealed Sheets, Cold Rolled	
Nos. 17 to 21	3
Nos. 22 and 24	3
Nos. 25 and 26	3
No. 27	0
No. 28	5
No. 29	0
No. 304.65 to 4.9	Ö.
Galvanized Sheets of Black Sheet Gage	
Nos. 10 and 11	0
Nos. 12 to 14	
Nos. 15 and 16	0
Nos. 17 to 21	18
Nos. 22 and 24	13
Nos. 25 and 26	3
No. 27	0
No. 28	D.
No. 29	0
No. 30	5
Tin Mill Black Plate	
Nos. 15 and 16	0
Nos. 17 to 21	š
Nos. 22 to 24	
Nos. 25 to 27	5
NOS. 20 10 21	57
No. 284.25 to 4.4	
No. 294.30 to 4.4	0
No. 304.30 to 4.4	ill.
Nos. 3014 and 31	0

# Iron and Industrial Stocks

New York, Feb. 7, 1917.

Prices collapsed on the stock exchanges last Thursday when Germany's announcement of its drastic submarine policy became public. It was feared that this meant the severance of our diplomatic relations with that country, and such became the fact on Saturday. Meanwhile, however, prices recovered to an extent from their extreme decline, and the stock market has since shown a disposition to maintain something like an equilibrium. Prices, however, have in but few stocks regained the level of Wednesday of last week. range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chal., com Allis-Chal., pref Am. Can, com	201/8	-	28	Int. Ha
Allis-Chal., pref	79 1/4	-	85	com.
Am. Can, com	36	-	48%	Int. Ha
Am. Can, pref1	106	-1	10	com.
Am. Car & Fdy.,			0.0	Inc. Ha
com.	21	10	68	La Bell
Am. Car & Fdy.,	101/	4	1007	
pref1	0917	-1	701/8	com. Lacka.
Am. Loco., com Am. Loco., pref1	0.2 10	-	0478	Lake S
Am. Rad., com				Lima L
Am. Rad., pref				Lukens
Am. Ship, com	50		63	Lukens
Am. Ship, pref.	94.84	_	9.5	Midvalo
Am. Ship. pref Am. Steel Fdries.	52	_	6214	NatAc
Bald. Loco., com.	43		5514	Nat. E
Bald, Loco., pref.1	0.00	-1	0116	com
Bald. Loco., com. Bald. Loco., pref.1 Beth. Steel, com.3	63	-4	22	Nat. Er
Beth. Steel,				pref.
Class B	118	-1	30	N. Y. A
Beth. Steel, pref. 1	123	-1	25	Nova S
Can. Car & Fdy.,				Pitts. 8
com		*	3.0	Pressec
Case (J. I.), pref.			85	Pressec
Central Fdry.,	00		0.4	Ry. Ste
com.	20	-	21	com.
Charcoal Iron,	m m/		0	Ry. Ste
Charcoal Iron,	1.78	, -	8	Republ
pref	6.1/		7	Republ
Chic Phen Tool	60	-	713/	Sloss, o
Colo. Filel	3.8 16	100	4706	Sloss,
Cruc. Steel, com	50 12	-	6814	Superio
Cruc. Steel, pref.	107	-1	14	Superio
Cruc. Steel, pref., Deere & Co., pref.	99	-	991/4	1st p
Driggs-Seabury .	39 74	-	60	Transu
Gen. Electric	161	~	170	iams
Gt. No. Ore Cert.	273/	1 -	3614	Un. Al
Gulf States Steel	991/	2-1	21	U. S. I U. S. I
Gulf S. Steel,				U. S. I
1st pref	102	-	1.05	U. S. S
Gulf S. Steel,			100	U. S. S
2nd pref		2 -	120	Va. I.
Harb-Walk, Refra			0.77	Warwi
com			126	Westin

Int. Har. of N. J.,
com
Int. Har. Corp., com
com 811/2 - 88
Inc. Har. Corp.,
pref
pref
com 711/6 - 801/6
Lacka, Steel 7014 - 8414
Lake Sun Corn 15 - 191/
Lima Loco 55 - 59 16
Lukens, com 33
Lukens, 1st pref., 98 - 9956
Midvale Steel 50 - 581/2
NatAcme 32 - 361/4
Nat. En. & Stm.,
com 24 - 311/4
Nat. En. & Stm.,
pref 961/2- 963/4
N. Y. Air Brake. 128 -144
Nova Scotia Steel 90 -105
Pitts. Steel, pref. 99 -1011/2
Pressed Stl., com. 73 - 81%
Pressed Stl., pref.104 -107
Ry. Steel Spring,
com 43 - 511/2
Ry. Steel Spring,
pref
Republic, com 65 - 78 Republic, pref 99 -103
Republic, pref 99 -103
Sloss, com 50 - 63 1/2
Sloss, pref 95 - 99
Superior Steel 33 1/4 - 33 1/2
Superior Steel,
1st pref 100 -100 1/2
Transue-Will-
iams 40 - 451/2
Un. Alloy Steel 42 - 50 % U. S. Pipe, com 17 - 23
U. S. Pipe, com., 17 - 23 U. S. Pipe, pref., 55 - 61
U. S. Steel, com., 99 -113 %
U. S. Steel, pref. 117 -120 %
Va. I. C. & Coke. 46 - 51
Warwick 91/4 - 91/4 Westing, Elec 46 - 531/4
Westing. Elec 46 - 531/4

#### Dividends

The America-La France Fire Engine Company, regu quarterly, 1 per cent on the common stock, payable Feb. 15 The American Radiator Company, regular quarterly, 3 p cent on the common stock, payable March 31, and an extra 50 per cent, payable in common stock March 15; also regul per cent on the preferred stock,

quarterly, 1% per cent on the product of the Preb. 15.

The Charcoal Iron Company of America, 20 cents per share on the preferred stock, payable March 31.

Deere & Co., regular quarterly, 1% per cent on the preferred stock, payable March 1.

The Eastern Steel Company, initial dividend, 2½ per cent on the common stock, payable April 16, and regular quarterly, 1% each, on the first and second preferred stock, payable March 15.

March 15.

The General Fireproofing Company, regular quarterly, 2 per cent on the common and 1% per cent on the preferred stock, payable April 1.

The Grant Motor Car Corporation, 17½ cents per share on the preferred stock, payable Feb. 1.

The International Harvester Company of New Jersey and the International Harvester Corporation, each 1% per cent on the preferred stock, payable March 1.

The Pittsburgh Steel Company, regular quarterly, 1% per cent on the preferred stock, payable March 1.

The Superior Steel Corporation, initial dividend, \$1.11 per share on the first preferred stock, payable Feb. 15.

The Wheeling Steel & Iron Company, stock dividend, 20 per cent, payable in common stock March 1.

The Harbison-Walker Refractories Company, extra, 6 per cent, on the common stock, payable Feb. 20.

cent, on the common stock, payable Feb. 20.

The Standard Metalwork Company, Thompsonville, Conn., Feb. 1, declared its semi-annual dividend of 31/2 per cent on its preferred stock and 31/2 per cent on its common stock, leaving a comfortable sum added to surplus. The business of the past year has been the largest since the company's organization about 12 It manufactures tubing and tubing parts for automobiles, aeroplanes and kindred work.

# Judicial Decisions

ABSTRACTED BY A. L. H. STREET

ACCIDENTAL INJURIES UNDER COMPENSATION ACT. An employee's death from heart dilation must be rean employee's death from heart dilation must be regarded as have followed an "accidental injury" in the course of his employment, within the provisions of the New York workmen's compensation act, if it resulted from aggravation of a cardiac lesion, due to his exertion in bending heavy iron rods. (New York Supreme Court, Appellate Division; Uhl vs. Guarantee Construction Company; 161 New York Supplement, 659.)

UNCERTAIN CAUSE OF INJURY .-- An employee is not entitled to recover damages for personal injury where the evidence leaves it an uncertain question whether the injury was sustained through one of several causes for which the employer would be responsible, or through a cause for which he would not be liable. The operator of a machine shop in which a traveling crane is used is under legal duty to inspect it and keep it in proper order to avoid injury to employees whose duties do not charge them with such inspection or (United States Circuit Court of Apmaintenance. peals, Seventh Circuit; Kief vs. Chicago, Milwaukee & St. Paul Railway Company; 236 Federal Reporter, 529.)

EXPLOSION OF MOLTEN IRON .- In a suit for injury to a molder through explosion of a mold, it was open to the jury to find that the employer was negligent in failing to have the mold warmed and dried before requiring the plaintiff to do his work. The employed was entitled to rely upon his foreman's statement that everything was right for the pouring. (Pennsylvania Supreme Court, Vanormer vs. Osborn Machine Company, 99 Atlantic Reporter, 161.)

REPAIR OF LEASED MACHINERY.—Where a machine is leased for a term of years, the lessee agreeing to keep it in good repair, he cannot avoid liability for the agreed rental on the ground that the machine has become antiquated or worn out, such condition being due to his own failure to keep the machine in proper repair. (Pneumatic Scale Corporation vs. Ideal Cocoa & Chocolate Company, 62 Pennsylvania Superior Court Reports. 30.)

RIGHTS AGAINST RAILROAD FOR FREIGHT INJURY. Under an agreement by the shipping seller of an appliance that the buyer should not be bound to accept it until after its installation in good working order, the seller is the proper party to make claim against the carrying railroad company for injury to the appliance in transit. (Dooley vs. New York Central & Hudson River Railroad Company, 62 Pennsylvania Superior Court Reports, 237.)

TIME FOR DELIVERING GOODS SOLD .- Where plaintiff contracted to sell 50,000 whistles to be specially manufactured for defendant and delivered "as soon as possible," the order being given June 21, defendant was not justified in refusing to accept delivery Aug. 31, it appearing that it took four weeks to assemble the necessary dies and materials to fill the contract. The fact that defendant desired the whistles for special use in an advertising scheme July 16 did not require plaintiff to make delivery by that time, it not appearing that delivery by that time was agreed upon, or that plaintiff knew when the contract was entered into that delivery was needed for any particular time. (Philip J. Ritter Conserve Company vs. Kolb, 62 Pennsylvania Superior Court Reports, 296.)

INJURY CAUSED BY DEFECTIVE WELDING APPARATUS. -An employer is liable for death of an employee in an explosion of oxygen-acetylene welding apparatus, if the accident was directly attributable to the employer's negligent failure to sufficiently instruct decedent in the use of the apparatus, or to carelessness in the manner in which the equipment was maintained. plant was maintained in a way customary in similar establishments is not conclusive as to the employer's freedom from negligence. But negligence on the part of the employer must be shown before his liability can be established. (Kansas City Court of Appeals, Fairfield vs. Bichler, 190 Southwestern Reporter, 32.)

# Metal Markets

### The Week's Prices

		its Per Pe		r Earl	y Deliv	ery	
		New York Electro-	New	New	St.	New	St.
Jan	Lake	lytic	York	York	Louis	York	Louis
31	33.00	33.00	45.75	8.25	8.15	10.50	10.25
3	33.00 33.00 33.00 33.00	33.00 33.00 33.00 33.00 33.00	49.00 51.00 55.00 55.00	8,50 8,50 8,50 8,50 8,50	8,30 8,30 8,30 8,30 8,30	$9.87\frac{1}{2}$ $9.75$ $9.75$ $10.00$ $10.25$	10.121/2 9.50 9.50 9.75 10.00

Only occasional small and odd lots of copper are available for nearby delivery, and prices are nominal. Tin is strong around 55c. The shortage of prompt lead continues acute, and for spot 9c. has been touched. Spelter is being traded in conservatively and prices are on the upward trend. Antimony is scarce and stronger.

New York, Feb. 7, 1917.

### New York

Copper.-Quotations are nominal. Occasionally there are offerings of small spot lots, but these are so irregular as to be incapable of making a market in the sense that tangible quotations are established. The producers reiterate that they have no metal to offer this side of June and July, for which positions they quote 30c. to 31c. Consumers, however, do not seem to be interested in those months, although to a limited extent they would take earlier copper. In the above table 33c. is carried as the nominal quotation for both Lake and electrolytic spot delivery, that being the last price around which any considerable business was done. Second hands to-day give 33c. as the nominal quotation for March delivery. Yesterday, a sale of a small lot of electrolytic for immediate delivery was reported at 34.50c. An interesting phase of the situation is that millions of pounds of copper intended for export are accumulating at New York and the amount is growing, although the railroads have endeavored to cut down shipments to the seaboard, and the trade is giving thought to what will ultimately be done with these stocks. It is conceded that if they are placed on the market prices are likely to be pressed downward. One suggestion is that the Government may commandeer these and other supplies. The exports this month, including yesterday, total only 4148 tons. The London quotation for spot electrolytic yesterday was £145 against £143 a week previous.

Copper Averages.—The average price of either Lake or electrolytic copper for January, based on daily quotations in The Iron Age, was 29.73c.

Tin.-On Jan. 31 and Feb. 1 and 2 between 400 and 500 tons changed hands. Buying was stimulated by the figures showing that 7177 tons had been delivered to consumers in January. These statistics had caused conjecture as to why the deliveries were so large, the general opinion being that consumers were building up their reserves against the day when supplies from abroad might be seriously reduced. On Feb. 1 the market was wildly excited, spot Straits opening at 47c., going to 49c., then to 50c., finally closing at 49c. sales were fairly large more would have been done had there been more sellers. On Feb. 2 the market was quiet but strong, spot Straits being quoted at 51c. and spot Banca at 49c. On Monday sales of spot Straits at 53c, were reported, the market closing with 55c. the nominal quotation; about 200 tons having been taken in the day. Yesterday sales aggregating 75 to 100 tons took place, Straits being quoted at 55c. and Banca at The monthly statistics show that total world stocks at the close of January amounted to 18,169 tons, against 20,737 tons a month previous, a decrease of 2568 tons. The deliveries this month, including yesterday, total 675 tons, and there is afloat 4248 tons.

Lead.—March delivery can be had around 8.50c., New York, and 8.30c. St. Louis. Spot lead and the ordinary 30-day shipment are now classed as specialties, commanding more or less fancy premiums, all of which

is the result of the railroad congestion. Lead which has been en route three months has yet to arrive at New York. Occasionally a carload gets through, but it is not enough to relieve the situation, and usually commands a high price. On Jan. 31 a small quantity of spot brought 9.12½c., New York. Yesterday 100 tons of spot brought 9c., New York, other lots being offered at 9.50c., a price which did not induce business. There is plenty of metal at St. Louis—the problem is to get it East. Great Britain has placed the same restrictions on dealing in lead that she put on copper transactions. The exports, Feb. 1 to 6, total only 2 tons. The London quotations for spot is unchanged at £30 10s.

Spelter.—This metal was tending toward easiness until yesterday morning, when it advanced \(^4\)c. to \(^4\)c., making the quotations 10.25c. to 10.50c., New York, and 10c. to 10.25c. St. Louis. At 10c. and upward, New York, producers booked a few orders this week, although they are largely confining their business to consumers in actual need. At present prices they are not much inclined to sell to jobbers. The cold in the West has seriously cut down production by interference with the natural-gas supply. The exports, Feb. 1 to 6, total 1110 tons. Spot was quoted at London yesterday at \(^247\).

Antimony.—Prompt antimony is scarce, also as a result of the inadequate arrivals from the West. Chinese and Japanese grades are quoted at 25c.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is stronger at 57c. to 59c. per pound.

Old Metals.—The market continues strong. Dealers' selling prices are as follows:

Cents per lb.
Cents per lb. Copper, heavy and crucible29.50 to 31.00
Copper, heavy and wire28.00 to 29.00
Copper light and bottoms24.50 to 25.50
Brass, heavy
Brass, light
Heavy machine composition24.50 to 25.00
No. 1 yellow rod brass turnings18,00 to 19.00
No. 1 red brass or composition turnings. 19.00 to 20.00
Lead, heavy 7.75
Lead, tea 7.25
Zinc 8.00 to 8.50

### Chicago

FEB. 5.—Events of the last few days have had an unsettling influence on the non-ferrous metal market and definite quotations for copper are not to be had. With the exception of spelter all prices are higher, tin in particular having jumped several cents. We quote: Casting copper, 30c.; Lake copper, 33c.; tin, carloads, 54c. to 58c., and small lots, 56c. to 60c.; lead, 7.92½c. to 8.50c.; spelter, 9.75c.; sheet zinc, 21c.; Cookson's antimony, 50c.; other grades, 26c. to 30c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 25c.; copper bottoms, 23c.; copper clips, 24c.; red brass, 23c.; yellow brass, 18c.; lead pipe, 7c.; zinc, 6.50c.; pewter, No. 1, 28c.; tinfoil, 35c.; block tin pipe, 39c.

### St. Louis

FEB. 5—Non-ferrous metals were sharply higher at the close to-day, except zinc, which slumped by the war situation threatening exports. The close to-day on carload lots was: Lead, 8.25c.; spelter, 9.50c. to 10c. On less than carload lots the quotations were: Lead, 8.50c.; spelter, 12c.; tin, 62c.; Lake copper, 34c.; electrolytic copper, 33.50c.; Asiatic antimony, 30c. In the Joplin ore district zinc blende was \$10 off from last week's price, with the basis range from \$80 down to \$65 per ton, with the week's district average \$76. Calamine was steady at \$45 to \$48. Lead ore was firmer at a top price of \$102, with the week's average \$100. On miscellaneous scrap metals we quote dealers' buying prices as follows: Zinc, 7c.; lead, 6c.; pewter, 25c.; tinfoil, 33c.; tealead, 4c.; light brass, 12.50c.; heavy yellow brass, 13.50c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 23c.

The Pittsburgh Steel Company, whose main offices are now located on the nineteenth floor of the Frick Building, Pittsburgh, has leased 35 rooms on the seventh floor of the new Union Arcade Building and expects to occupy them on or before May 1.

### REPUBLIC COMPANY'S REPORT

### Remarkable Statement of Year's Business, Less Than Seven Per Cent of Which Was War Steel

The seventeenth annual report of the Republic Iron & Steel Company, giving the results of its operations in the year ended Dec. 31, 1916, is an impressive document indicating the tremendous growth of the company's business. In 1914 the net earnings, after deducting charges for maintenance and repairs, totaled \$2,330,672.83; in 1915 they amounted to \$5,439,598.41; but they jumped to \$16,544,635.61 in 1916. Net profits for 1914, 1915 and 1916 respectively were \$1,869,073.71, \$4,385,723.12 and \$15,647,899.56. The net working assets for the three years, 1914, 1915 and 1916, are given respectively at \$10,752,361.33, \$13,510,789.87 and \$19,721,351.18. Of the 1916 assets, \$9,608,139.27 is in cash, against \$3,760,237.47 in 1915 and \$797,291.38 in 1914. The statement of income for two years is as follows:

#### Comparative Statement of Income

Net earnings from operations, after deducting charges for	1916	1915
maintenance and repairs	316,544,635.61 348,576.51	\$5,439,598.41 183,310.55
Total profits Less provisions as follows:	16,893,212.12	5,622,908.96
Depreciation and renewal of plants Extraordinary depreciation Exhaustion of minerals	600,090,61 400,000.00 245,221.95	$\begin{array}{c} 600.387.80 \\ 400.000.00 \\ 236.798.04 \end{array}$
Net profits	$\substack{1.245,312.56\\15,647,899.56}$	1,237,185.84 4,385,723.12
notes	858,736.79	869,903.93
Net profits applicable to divi- dends	14,789,162.77 8,354,953.66	3.515,819,19 6,615,289,54
D-34	23,144,116.43	10.131,108.73
Deduct: Dividends on preferred stock 18 per cent Dividends on common stock	4,500,000.00	
1½ per cent Dividends on preferred stock	407,865.00	
4% per cent		1,187,500.00
plus account		588,655.07
Net surplus Dec. 31	\$18,236,251,43	\$8,354,953.66

#### Inventories

The total value of inventories, as indicated below, the report says, shows an increase, but not what might be expected from the increase in prices of materials and tonnage produced or from the volume of business. This is explained by the fact that the company is now more largely self-contained in its principal raw materials. The inventory was taken in accordance with the usual custom of costs for all products mined or manufactured by it, and the purchased material, was also taken at cost, but below the present market price, in all cases.

	1916	1915
Finished product		\$1,560,109.67 592,706.79 39,418.22
Billets, blooms, slabs, etc Ores	666,540.08 2,874,973.08	438,141.66 2.868.495.96
Scrap	497.548.29	533,988.14 303,758.66
Fuel	348,561.67 109,317,42	191,693.14 58,510.03
Stores	1,141,085.82 65,460,66	698,155.62 57,272,77
Miscellaneous	171,804.19	292,477.45
Total	\$8,814,358.53	\$7,634,728.11

The gross volume of business for the year ended Dec. 31, 1916, was \$52,844,017.66. For 1915 it was \$29,916,228.74, and for 1914 it was \$21,366,249.35.

#### Comparative Statement of Property Account

New construction	55,223.55	\$1,502,045.07 16,968.95
Property sold Property written off. Unexpected balance of provision for depreciation and renewals	55,593,50 800.00	30,000,00
for year	758,234.45 69,104,042.06	817,441.45 66,828,222.30

The construction of the new blast furnace at the Haselton group, Youngstown, Ohio, mentioned in the

last report, has been delayed by existing labor and other conditions, but is rapidly nearing completion. It is the intention to produce at Haselton furnaces the maximum amount of electric power obtainable there from excess blast-furnace gas, and use it at the company's various finishing mills. At the company's Southern blast furnaces at Thomas, near Birmingham, Ala., No. 2 furnace has been rebuilt, making it of the same capacity as No. 1 and No. 3, these furnaces now being thoroughly modernized.

The company in 1916 produced 1,117,597 gross tons of pig iron, against 1,056,104 tons in 1915, and 771,811 tons in 1914. The Bessemer steel plant established a new high record for a year's work, the production in 1916 having been 718,377 tons against 578,940 tons in 1915, and 391,826 tons in 1914. The open-hearth steel works produced more steel than in any former year, the output being 541,594 gross tons, against 464,208 tons in 1915 and 371,409 tons in 1914. The total production of steel was nearly up to the theoretical capacity of 1,300,000 tons.

During the year extensions to the tube works, noted in the last report, have been in process of construction, and one butt-weld mill has been put into commission, and is now operating. The lap-weld mill is practically completed. This not only increases the company's tube-making capacity by 50 per cent, but also extends its range of sizes from 12-in. to 16-in. pipe as a maximum.

The production of finished and semi-finished products in 1916 totaled 1,216,716 net tons, against 1,033,394 tons in 1915, and 760,054 tons in 1914.

The production of iron ore totaled 1,693,450 tons in 1916, against 1,440,376 tons in 1915 and 1,253,105 tons in 1914. The report says: "While the production for the year shows an increase over the preceding year, it was not up to maximum, owing to the fact that the output of the ore mines was based largely upon the company's uses for ore. There is yet surplus producing capacity at the ore mines to take care of the ore needed in the company's new Haselton furnace in the North, and to provide for the increased needs in the South."

Its iron-ore reserves, as of Dec. 31, 1916, totaled 112,923,513 tons as compared with 114,681,551 tons in 1915. Under the heading of coal and coke the report says: "Coke production in 1916 totaled 1,285,640 tons, against 1,119,157 tons in 1915 and 850,911 tons in 1914."

### **Balance Sheet**

The balance sheet as of Dec. 31, 1916, is as follows:

Assets	
Cost of properties Dec. 31, 1915 Net additions for 1916	\$70,733,685.06 3,023,800.21
Investment in Potter Ore Company and other companies Total capital assets. Cash deposited for redemption of bonds	927,699.67 74,685.184.94 79,957.00
Inventory of manufactured products, material, etc.	8,814,358.53
Ore contract payments represented by ore at docks	931,207.38
Accounts and bills receivable after deducting reserve for doubtful accounts	6 465,686.59 9,608,139.27
Expenditure for stripping at mines, advanced royalties, etc., chargeable to future operations	780,771.15
Total	\$101,365,304.86

	Liabilities
\$27,191,000,00 25,000,000,00	Common stock issued
16,346,000.00 255,500.00 194,000.00 3,392,633.61 31,435.18 618,840.30 207,020.83 1.845,365.00 2,745.75	Total 10-30 year bonds outstanding Potter Ore Company bonds outstanding Martin & Palos Coke Works properties Accounts payable Ore contract balances representing cash received in excess of the value of ore shipped to cus- tomers Taxes accrued Interest accrued Provision for dividend payable Jan. 1 and Feb. 1, 1917. Unclaimed dividends Reserves:
8,044,512.84 18,236,251.43	Exhaustion of minerals and mining equipment \$2,322,635.39  Depreciation and renewals of plants \$4,653,443.21  Relining and rebuilding furnaces 550 502.03  Fire and accident insurance 233,228.57  For contingencies 284,703.64  Surplus Dec. 31, 1916
101,365,304.86	Total \$

() labor and employment the report says: "Full employment and scarcity of labor, throughout all industrial districts, necessarily brought about general advances in all classes of labor, three advances in labor rates having been made. The present minimum rate for unskilled labor at our plants is 27 1/2c. per hour, the highest rate ever paid, the total increase aggregating over 40 per cent during the year." The grand total of men employed at the end of 1916 was 13,056, against 11,105 in 1915, and 9906 in 1914.

#### General Comments

A statement preceding the statistical report says: "The extraordinary conditions of demand for iron and steel referred to in the last semi-annual report of this company were emphasized in the last half of the year, current demand being in excess of current production. but notwithstanding the substantial additions to the productive capacity of the country during the year, prices advanced; in fact, all previous high price records for finished steel products were exceeded. While the steel trade in general has been benefited by the large and increasing demands for munitions steel, and this company has received indirect benefits, yet not over 7 per cent of our sales was war steel, for the reason that our trade demanded the bulk of our production in commercial steel. Operating conditions have been exceedingly trying during the year, by reason of transportation troubles, and also on account of the character and supply of labor, but, notwithstanding these difficulties and consequent abnormal high costs, the year 1916 will go down in history as a record one in respect to output, high prices and earnings."

The company's unfilled orders for finished and semifinished steel as of Dec. 31, 1916, totaled 617,950 tons, against 591,270 tons at the end of 1915, and 199,058 tons at the end of 1914. Unfilled orders for pig iron at the close of 1916 totaled 183,026 tons, against 138,406 tons at the end of 1915 and 99,624 tons at the end of 1914. In this connection the following comment is made: 'We have not only full order books, but the character of our business is now more largely diversified than ever before; furthermore, export sales have become a larger factor in our operations, and also the country's combined exports of iron and steel have become a stronger sustaining factor to the iron and steel markets, and consequently, if a substantial volume of exports can be maintained, greater stability should be given the future markets for iron and steel. As orders booked will engage our capacity for months to come and at remunerative prices, the outlook for the future was never more promising."

### Deere & Co.'s Annual Report

The corporation of Deere & Co., manufacturer of agricultural implements, Moline, Ill., has issued its annual report for the fiscal year ended Oct. 31, 1916. The showing made in that year was far better than in the previous two years. The income account places the total earnings of all subsidiaries, after deducting operating and maintenance expense, depreciation, pensperating and maintenance expense, depreciation, pensions and usual reserves, at \$4,783,081, against \$3,248,-023 for the preceding year. The surplus available for dividends was \$4,117,993, and after the payment of dividends on the preferred stock the surplus remaining was \$1,469,998. This surplus compares with \$600,028 the preceding year and a definite faces 2016 for the the preceding year and a deficit of \$562,916 for the year ended Oct. 31, 1914. Indebtedness was reduced in 1916 no less than \$7,760,650, leaving \$2,824,823 at the close of the year as the total indebtedness of all kinds owing by the company and its subsidiaries. The net working capital at the close of the year was \$29,425,582, against \$27,669,616 at the close of the preceding year.

The twelfth plant installed by the Burdett Oxygen Company, maker of electrolytic oxygen and hydrogen, Chicago, will be put in operation on Feb. 15. It is located at the Stock Yards Station, Oklahoma City, Okla., and will furnish oxygen to users in the surrounding territory.

### New Steel Foundry in Milwaukee

The Hercules Steel Casting Company, Milwaukee, Wis., is being organized to establish an open-hearth steel foundry, with a daily capacity of 35 to 40 tons. The originator of the new organization is Frank E. McIntyre, for 30 years associated with the steel foundry business, and in recent years general superintendent of the National Steel Foundries, subsidiary of the National Brake & Electric Company, Milwaukee. Articles of incorporation of the company, which have been filed, show that the \$400,000 capital stock is divided into 27,500 shares of preferred and 12,500 shares of common. The incorporators are Frank E. McIntyre, J. J. McGovern, E. B. Gennrich and Francis E. Mc-Govern, attorney. Mr. McIntyre will be president and general manager. Before going to Milwaukee he was connected with the Tennessee Coal, Iron & Railroad Company at Birmingham, Ala., and the Colorado Fuel & Iron Company, Pueblo, Col.

Work will start as soon as weather conditions permit on the erection of the main building of the new plant, 70 x 500 ft., with a 60-ft. side bay, equipped with two open-hearth furnaces of 20 to 25 tons capacity, and five electric traveling cranes of various sizes. Contracts for the equipment are now being placed, and it is hoped to get delivery in time to start operations July 1. The company plans to produce castings up to 30 tons and an output of about 1200 tons per month. Although the exact location of the plant is not divulged, it is stated that the site is in one of the suburbs of Milwaukee. Temporary offices have been established at 500 Free

Press Building.

# N .& G. Taylor Company Now a Corporation

On Feb. 1, 1917, the business previously conducted by the firm of N. & G. Taylor Company as a co-partnership was incorporated under the laws of Maryland as the N. & G. Taylor Company, Inc., with the following officers: Hollinshead N. Taylor, president; William W. Justice, Jr., vice-president; David W. Banks, secretary-treasurer; L. Leslie Helmer, assistant secretary-treasurer. The charter authorizes the issue of 6250 shares of preferred stock with par value of \$100 and 1750 shares of common stock without par value.

The new company takes over the business that has been run for 107 years as a private firm, always under the control of the direct descendants of the founders, the president of the new company being a great-grandson of William Taylor, who, with his brothers George and Tracy Taylor, established the business in

Philadelphia in 1810.

The company's plant, which comprises a complete orks for the manufacture of high-grade tinplate of all kinds, from the pig metal through to the finished product, is located at Cumberland, Md., and the general offices are at Philadelphia. Extensions are now in progress at the Cumberiand plant to increase the output. These include additions to the black-plate department, a new foundry, an extension to the tin house, and new shipping facilities.

The Four Wheel Drive Automobile Company, Clintonville, Wis., at its recent annual meeting authorized a cash dividend of 15 per cent and a stock dividend of 100 per cent on the present capitalization of \$500,000. A year ago, on the then capitalization of \$250,000, the stockholders authorized a cash dividend of 30 per cent and a stock dividend of 100 per cent. In the past year the factory facilities have been more than doubled and further extensions are now under way. The annual report of W. A. Olen, president, who was re-elected by acclamation, stated that if the company had ceased accepting orders on Jan. 1 the plant would be kept busy at capacity until July 1.

Eaton, Rhodes & Co., Cincinnati, pig-iron and coke merchants, have lately made contracts with nearly every blast furnace in the Ironton district for its supply of coke for the remainder of this year. It is understood that these contracts were made on a sliding scale basis.

# PERSONAL

R. H. Sweetser, for some time president of the Thomas Iron Company, Hokendauqua, Pa., has been made works manager of the Columbus Iron & Steel Company, Columbus, Ohio. He was superintendent of that company's furnaces before engaging with the Thomas Iron Company.

William J. Lynch, manager of the plant of the National Enameling & Stamping Company at Granite City, Ill., who has resigned to become manager of the Standard Sheet & Tin Plate Company, Cannonsburg, Pa., was the recipient of a silver loving cup Jan. 27 at a dinner given him by a large number of his friends at the Planters Hotel, St. Louis.

Murray M. Duncan, general manager, Cleveland-Cliffs Iron Company, Cleveland, has been elected vice-president of the company to succeed the late J. H. Sheadle. He will be in charge of mining operations and will retain the duties of general manager and continue to have offices in Marquette, Mich.

J. A. Nelson has resigned the position of vice-president of the East Jersey Pipe Corporation, whose office is at 50 Church Street, New York, and works at Paterson, N. J., and is now taking a desired vacation.

At a recent directors' meeting of the William Cramp & Sons Ship & Engine Building Company, Philadelphia, H. Burchard Taylor, secretary and treasurer, was elected a vice-president, succeeding E. S. Cramp, and was also elected a director to succeed F. L. Hine, of New York.

Ninian J. Barr, managing director of N. J. Barr, Ltd., a corporation operating the Larchfield Iron Works, with warehouse at Leeds, England, was a recent visitor in Pittsburgh.

E. W. Richey has been elected vice-president and J. G. Coles treasurer of the Standard Forgings Company, 411 Railway Exchange Building, Chicago. George E. Van Hagen is president.

C. E. Irwin and J. E. Polhemus have resigned from the sales department of the Colonial Steel Company, Pittsburgh, and are now connected with the sales department of the Vulcan Crucible Steel Company, Aliquippa, Pa. They will have charge of sales in the Pittsburgh district. It is the intention of the company to open a general sales office in Pittsburgh shortly, of which they will then have charge.

S. Coles Peebles has been elected general manager of the Ashland Iron & Mining Company, Ashland, Ky., and will have charge of its steel plant now under construction. Mr. Peebles is closely identified with large interests in the vicinity of Ironton and Portsmouth, Ohio.

John C. Haswell'has been re-elected president of the Dayton Malleable Iron Company, Dayton, Ohio. The first vice-president is S. W. Davies; second vice-president, M. F. Gartland; secretary, W. H. Cassel; treasurer, Adolph Heinz.

J. V. Schrock, for 12 years chief clerk at the Union works of the Carnegie Steel Company at Youngstown, has been appointed chief clerk of the entire Youngstown district. Lee Van Metre, for nine years chief clerk at the company's Ohio works, has been appointed assistant chief clerk of the Youngstown district.

J. G. Rohrman, who resigned recently as representative of the Youngstown Sheet & Tube Company at Atlanta, Ga., has been appointed Chicago representative of the Allegheny Steel Company, Brackenridge, Pa.

L. A. Green, 1405 First National Bank Building, Pittsburgh, has been appointed Pittsburgh district manager for the Bedford Foundry & Machine Company, electric cranes, Bedford, Ind. He will be in charge of all of Pennsylvania, West Virginia and eastern Ohio.

David C. McKay, well known in the motor truck and accessory field, has joined the Michigan Electric Welding Company, a member of the Steel Products

Company, and will represent this company in Michigan territory.

Charles Hastings has been made vice-president and general manager of the Hupp Motor Car Corporation, Detroit.

Henry Barton, who has been an executive of the General Motors Company for many years, has been made president of the Northway Motor & Mfg. Company, Detroit.

The National Association of Manufacturers has appointed Carl M. Hansen, widely known through his activities in connection with accident prevention, compensation and casualty insurance, as chairman of the association's committee for accident prevention and workmen's compensation. He is managing director of the Pennsylvania Mutual Liability Association, organized by employers to carry compensation on the mutual plan in that State, and is also secretary and general manager of the Pennsylvania Bituminous Mutual Association, organized among coal operators in Pennsylvania for the same purpose. Mr. Hansen is also the author of "Universal Safety Standards," a work of 13 volumes, and has been a frequent contributor to technical journals on subjects relating to compensation, prevention and occupational diseases, as well as related subjects.

E. B. Merriam, for several years assistant engineer of the switchboard department of the General Electric Company, Schenectady, N. Y., has been assigned to much more important duties. He now heads the industrial service department, recently organized to supervise education, employment and provision of opportunities for advancement of employees at the Schenectady plant. He has been connected with the company for 16 years, starting as a student in the testing department and later doing service in commercial, manufacturing and engineering development and research work.

Mr. and Mrs. Edgar Bloxham, Paris, France, exclusive agents for France of the Kempsmith Mfg. Company, milling machines, Milwaukee, spent several days last week at the Milwaukee tool works to arrange for deliveries of a considerable list of machines during 1917. Mr. Bloxham visits the Kempsmith works once a year, but this is the first visit to Milwaukee of Mrs. Bloxham, who is a partner in the business, since 1909.

Edward J. Kearney, secretary and treasurer Kearney & Trecker Company, milling machines, Milwaukee, has been appointed a member of the Wisconsin State Board of Industrial Education by Gov. E. L. Philipp. Mr. Kearney succeeds August S. Lindemann.

Fred Ziegahn has been elected president of the Chippewa Foundry & Machine Company, Chippewa Falls, Wis., which began manufacturing operations in its new plant Feb. 1. The vice-president is L. J. Vaudreuil; secretary and treasurer, P. T. Favell.

Otto Rudd, general superintendent, Simmons Company, steel beds and springs, Kenosha, Wis., has been elected vice-president of the company in charge of physical properties. He is succeeded by James Ferris as general superintendent. Mr. Ferris seven years ago was employed in the buffing department at \$2 a day and gained his rapid promotion by important inventions and designs of machines and processes in the Simmons plant.

C. K. Lassiter, who was appointed vice-president of the American Locomotive Company in charge of manufacturing, to take effect Feb. 1, entered the service of the Richmond Locomotive Works in 1892 as clerk in the piecework department. In 1894 he was made chief clerk to the late Joseph Bryan, then president of the Richmond Works. In 1902 he was transferred to the Schenectady plant of the American Locomotive Company as chief clerk to the general manager. later appointed mechanical expert in charge of designing, developing and maintaining all shop equipment, shop systems and piecework departments. In 1907 he was transferred to the company's New York office and made mechanical superintendent in charge of all betterments, designing and maintaining equipment for all plants. Aside from his identification with the American Locomotive Company Mr. Lassiter served as president of the Baush Machine Tool Company, Springfield, Mass. He was also president of the Quigley Furnace & Foundry Company of the same city, and acted as consulting engineer for various industrial plants throughout the country.

Thomas D. Temple, superintendent of the plant of the American Steel & Wire Company, at Anderson, Ind., has been transferred to Birmingham, Ala., and Harry O'Connor will go to the Anderson plant from DeKalb, Ill.

George Kent, employment agent, Bucyrus Company, South Milwaukee, Wis., has been promoted to the position of assistant general superintendent.

Walter Kidde, engineer-constructor, 140 Cedar Street, New York, has incorporated his organization under the title of Walter Kidde & Co., Inc. The organization now includes departments of construction and hydraulic steam, mechanical, electrical and chemical engineering. The officers of the company are: Walter Kidde, president; B. G. Worth, vice-president, and I. R. Lewis, secretary and treasurer. The board of directors includes Henry Lang, vice-president Ingersoll-Rand Company, and E. S. Boyer, who is associated with the American Hard Rubber Company. Mr. Kidde's other principal associates, who comprise the engineering board of the corporation, are A. B. Miller, Walter S. Wainwright, M. I. Buttfield and E. Schwarz. Thorlief Fliftet is chief draftsman. Mr. Kidde has also been elected president of the Barlow Foundry Company, Newark, N. J., under a recent reorganization.

At the recent annual meeting of the American Metal Wheel Company, Toledo, Ohio, C. W. Bennett was elected vice-president to fill the vacancy caused by the death of Frank H. Steel and A. C. Argue was elected to fill the vacancy on the board of directors.

Howard J. Stagg, Jr., metallurgist, Halcomb Steel Company, Syracuse, N. Y., read a paper Wednesday evening, Feb. 7, before the Steel Treating Research Club of Detroit, Mich., on "Impact Tests, Their Interpretation and Their Relation to Brinell, Tension and Torsion Tests."

John E. Otterson has been elected first vice-president and general manager of the Winchester Repeating Arms Company, New Haven, Conn. He became connected with the company about a year and a half ago as general superintendent and was elected a vice-president last October.

At the annual meeting of Templeton, Kenly & Co., Ltd., manufacturer of Simplex jacks, held in Chicago Feb. 3, H. W. Finnell, vice-president of the company, was elected a director.

W. P. Snyder, president Shenango Furnace Company, Pittsburgh, will spend the remainder of the winter at Palm Beach, Fla.

Irvin F. Lehman, vice-president Knox Pressed & Welded Steel Company, Pittsburgh, has gone to St. Augustine, Fla., to spend the winter.

W. Lloyd Wolfe has been named general superintendent of the Bethlehem Steel Company's blast furnaces and coke-oven plant at Lebanon, Pa., including the Bird Coleman, North Lebanon, Colebrook and North Cornwall plants, effective Feb. 1. Mr. Wolfe has been superintendent of the Lackawanna Iron & Steel interests since 1908, being elevated to that place from the assistant superintendency of the Cornwall plant. R. V. McKay, acting superintendent at the North Lebanon furnace, will remain in an advisory capacity.

Samuel Adams, formerly night superintendent of the Farrell, Pa., plant of the American Sheet & Tin Plate Company, has resigned, effective Feb. 15. He will be connected with the McKeesport Tin Plate Company, McKeesport, Pa.

W. A. Forrester has been made director of purchases of the Union Switch & Signal Company, Swissvale, Pa. John P. Wright has been appointed assistant to President J. W. Marsh, in charge of engineering.

The Musconetcong Iron Works, Stanhope, N. J., states that it has not sold its blast furnace. A report to that effect has been widely circulated in the daily papers.

# STRENGTHENING GOVERNMENT

### The President to Be Authorized to Commandeer Shipyards and Other Plants

Washington, Feb. 6, 1917.—Comprehensive measures of far-reaching importance to the shipbuilders, munition makers and other manufacturers of the country were brought forward in the House of Representatives today, bearing the sanction of the Attorney General and other high officers of the Administration, and intended to enable the Government to meet the threatened war crisis.

These measures, which were presented as amendments to the Naval Appropriation Bill by Chairman Padgett of the House Committee on Naval Affairs, include an authorization of the President, in the event of war or of national emergency, to commandeer all shipyards and establishments capable of manufacturing war material; the appropriation of \$150,000,000 to hasten the completion of naval vessels authorized by Congress, or other war material needed to put the nation in a state of preparedness, and an appropriation of \$1,000,000 to enable the Government to acquire the basic patent of a suitable aeroplane for naval and military service. The President is further authorized, in time of actual war, to draft into the naval service of the United States any or all of the officers or employees of any establishment equipped for building ships or producing war material for the navy, the compensation to be received by such officers and employees being such as they were accustomed to receive in private employment for similar services.

Owners of shipyards and munition plants are authorized to receive just compensation for their use, and in default of agreement with reference thereto such owners are specifically authorized to bring suit for recovery of reasonable rentals and damages in the United States Court of Claims. Persons violating the provisions of this law or failing to comply with any direction, regulation, or restriction imposed thereunder are made subject to a fine of not to exceed \$10,000 or imprisonment for two years.

W. L. C.

### The Mining Engineers' Meeting

The American Institute of Mining Engineers will hold its 114th meeting at the Engineers Societies Building, New York, Feb. 19 to 22. The program includes the usual technical sessions, papers on steel and metal-lurgical problems being of more than usual interest and

Technical sessions on geology and metallography will take up the morning session on Monday, Feb. 19, with meetings on petroleum and gas and on milling and smelting in the afternoon. That evening a reunion smoker, with appropriate entertainment, will be a feature. Technical sessions will take up the time on Tuesday with one on iron blast-furnace practice in the afternoon. The annual dinner will be held at the Hotel Astor that evening.

The manufacture of iron and steel will be discussed at the session Wednesday morning with simultaneous sessions on metallography and the heat treatment of steel and on mining methods that afternoon. In the evening an entertainment and lecture are to be provided with Thursday devoted to an all-day excursion to the West Point military academy.

A New York meeting of the American Society of Mechanical Engineers will be held on Tuesday evening, Feb. 13, at the Engineering Societies Building, 29 West Thirty-ninth Street, New York. President Ira N. Hollis will make an address on "The Engineer and Organization," and Charles Wallace Hunt will discuss "Narrow Gage Motor Cars."

# OBITUARY

#### Charles T. Schoen

Charles T. Schoen, who is given credit as being the original designer of the pressed steel car now in such general service on railroads, died on Sunday, Feb. 4, of pneumonia, at his home in Moylan, near Philadelphia, aged 72 years. While a salesman and engineer for the Charles Scott Spring Company, Philadelphia, he studied the wooden construction of railroad cars and concluded that steel was its natural substitute. With this idea in mind, Mr. Schoen formed a



CHARLES T. SCHOEN

company and a small plant was established at Woods Run, in Allegheny, Pa., now known as the North Side, Pittsburgh. Steel specialties for wooden cars were made for some time, but the company took up the manufacture of steel cars and organized what has been known for years as the Pressed Steel Car Company. The first large contract received was for 1000 cars of 100,000-lb. capacity for the Bessemer & Lake Erie Railroad, owned by the United States Steel Corporation and operated by the Carnegie Steel Company. Steel cars soon became very popular, and the present large plant of the Pressed Steel Car Company, at McKees Rocks, near Pittsburgh, was built largely under the supervision of Mr. Schoen. Some years ago he retired from that company and built at Butler, Pa., a plant for the manufacture of the Schoen pressed steel carwheels. This is now owned and operated by the Standard Steel Car Company, organized some years later by Mr. Schoen and others. Mr. Schoen has not lately been active in business, having in fact transferred to others his business holdings. He was decorated with the ribbon of the Legion d'Honneur by the French Government in recognition of his valuable contributions to the world's progress. Besides his nephew, W. H. Schoen, he leaves three daughters. His son, Edward T. Schoen, died several years ago.

GEORGE W. STAHL, president and founder of the Edgement Machine Company, Dayton, Ohio, died at his home Jan. 25, aged 40 years. He was a native of Indiana and early in his boyhood days showed a marked aptitude in solving mechanical problems. Before he was 21 he had started in a barn a machine shop that became the foundation of the company of which he was president at the time of his death. He was a member of all the clubs in Dayton. He was greatly interested

in charitable work, but took special pleasure in giving encouragement to young men, and even his most intimate friends did not realize how successful he had been in his unostentatious efforts in this regard. He leaves his widow and three sons.

CHARLES E. MACBETH, secretary and treasurer of the Long & Allstatter Company, Hamilton, Ohio, died at his home Jan. 29, aged 81 years. He was bom in Urbana, Ohio, and in the early sixties moved to Hamilton, where he helped to organize a firm for the manufacture of wood-working machinery. In 1874 he acquired an interest in the Long & Allstatter Company. He was prominent in civic affairs, but refused to hold a public office of any kind. He leaves two daughters.

ARTHUR KING, president of the Middletown Car Company, a subsidiary of the Standard Steel Car Company, died at his home in Middletown, Pa., Jan. 31, aged 75 years. He had been ill since Christmas from heart trouble. He learned the machinist's trade when a boy and subsequently became foreman of the carworks of G. W. Ilgenfritz, York, Pa. He removed to Middletown in 1879 and entered the employ of the Middletown Car Company, which was taken over by the Standard Steel Car Company in 1909. He leaves three children.

JAMES TERRY, president Terry Steam Turbine Company, Hartford, Conn., died at Saranac Lake, N. Y., Feb. 3, aged 44 years. He had been in poor health for several years and had been a frequent sojourner at Saranac Lake to recuperate. He was the son of the late E. C. Terry, one of the founders of the business, and was a graduate of Sheffield Scientific School, Yale University.

CHARLES HANSEN, Beloit, Wis., who established one of the first plow and farm tool manufacturing establishments in the Central West, died Jan. 31, aged 87 years. He was born in Norway and was taken to Beloit when a boy.

CHARLES J. LINBERG, Sr., formerly owner of the Excelsior Foundry, St. Louis, died Jan. 27 at the home of his son. He leaves his widow, three sons and a daughter.

SIMON MARX of A. Marx & Sons, dealers in secondhand machinery and iron and steel scrap, New Orleans, La., died Jan. 18.

#### Welsh and American Tin-Plate Industries

Illustrating the extent to which the growth of the tin-plate industry in the United States has gradually supplanted imports from Wales the following statement from Commerce Reports is interesting:

In 1862 the exports of Welsh tin plate to the United States amounted to 29,541 tons as against 20,480 tons to all other countries; in 1882 exports to the United States had increased to 214,552 tons, and to all other countries 50,464 tons. In 1889 the United States purchased 336,920 tons and all other countries only 93,931 tons. The Welsh tin-plate business with the United States between 1862 and 1889 increased 307,379 tons as against 73,451 tons for all other countries.

In 1913 the total output of tin plate in the United Kingdom was 823,500 tons, of which the United States took only 21,516 tons and all other countries 544,756 tons, as compared with a total production of 586,250 tons in 1891, of which 325,643 tons went to the United States and 123,236 tons to all other countries.

Since the outbreak of the war the tin-plate industry of Wales has declined rapidly. At the end of September, 1916, there were 315 tin-plate mills in operation in the United Kingdom, a decrease of 92 mills since September, 1915, and a decline of 266 mills from the number in operation just previous to the outbreak of war. These mills are not idle for lack of demand for tinplate, but for the reason that the manufacture is prohibited except in connection with government contracts.

The Municipal Civil Service Commission, Municipal Building, New York City, will receive applications until Feb. 16 for the position of civil service examiner in mechanical engineering. The duties are to prepare and rate examinations for positions regarding a knowledge of mechanical engineering, and candidates must have had at least five years' experience in mechanical engineering.

### THE REVENUE BILL

# Passed by the House-Burden of the Attacks Against It

Washington, D. C., Feb. 6, 1917.—The Kitchin revenue bill authorizing a bond issue, an issue of short-time Treasury notes, a 50 per cent increase in the federal inheritance tax, and an innovation in the shape of an excess profits tax of 8 per cent upon the net gains of partnerships and corporations in excess of the sum of \$5,000 and 8 per cent of the actual capital invested, passed the House on Feb. 1 by a vote of 211 to 196. A large number of amendments to the bill designed especially to provide a more equitable distribution of the excess profits tax were offered on the floor but were voted down by varying majorities and the bill, as finally sent to the Senate, was exactly in the form in which it was reported by the Ways and Means Committee.

Notwithstanding the complete victory of the majority leaders in passing the bill without amendment, they were not able to rush it through the House as had been planned but were obliged to spend three full days in its consideration, and on the final vote Representatives Caldwell, New York; Callaway, Texas; Doughton and Page, North Carolina, Democrats, and Copley, Illinois; Martin, Louisiana, and Schall, Minnesota, Progressives, and London, New York, Socialist, joined the solid Republican side in voting against the measure. Messrs. Kent, California, Independent, and Randall, of the same State, Prohibitionist, were the only members of the House other than Democrats who cast their votes for the bill.

#### Excess Profits Tax the Storm Center

The excess profits tax was the storm center throughout the debate, Chairman Kitchin and his Democratic colleagues seeking to defend it as "a tax on those best able to bear it," while its opponents assailed it in vigorous terms as a cowardly makeshift, an illogical method of raising revenue and an unjust and discriminating impost which placed a penalty on success and provided exemptions for the sole purpose of making votes. A feature of the bill that was sharply assailed by many members of the House was the discrimination in the imposition of the excess profits tax against partnerships and in favor of individual ownership. In this connection Representative Green, Iowa, an influential member of the minority, said:

This is not an excess profit tax in any just sense of the term. It is not a tax on what a man might receive over and above the profits of a normal year. It is simply a hit of miss, catch as catch can, here and there measure, without any just plan, or rhyme or reason or right. Certain persons who happen to receive an income from their business of over \$5000 and \$ per cent on their capital, however small it may be, are taxed. Take a little partnership using \$20,000 in its business. Pour partners who have only \$10,000 of their own borrow the remainder. Did the gentleman from North Carolina (Mr. Kitchin) ever figure out how much taxes they would pay if they happened to make \$10,000, which, divided among the four would give them only \$2,500 apiece? They would pay somewhere between \$200 and \$300. Right across the street from them is another man carrying on exactly the same kind of business but owning it individually. He would not pay a cent under this bill!

Is there anyone who can justify the imposition of this tax upon any such principle as that? Why have they done it? Simply because they hoped it would reach so few in its operation that there would not be a great amount of complaint. The gentleman from North Carolina said the other day that there would be a great deal of denunciation of this tax. That part of his statement was true, and when he and other gentlemen go home after having voted for this bill and are shown these inequalities they will hear from their constituents. The American people have been paying their taxes carelessly, thoughtlessly and often willingly and patriotically. Each citizen ought to be willing to pay his share of the taxes and most of them are, but now he wants other men in the same circumstances to pay the same amount that he does and the people will demand it.

# Exemption in Favor of Agriculture

The excess profits tax was also assailed because an exemption was provided therein in favor of agri-

culture. Representative Meeker, Missouri, declared that there was no justification for exempting wealthy ranchmen, sugar planters and stock-raisers, while taxing the small merchants and manufacturers. He charged that the present Congress has voted millions to aid the agricultural classes but that the majority leaders "did not have the nerve to take a cent away from the rich farmer to make him help pay the bill." The concern of the leaders for the hard-working farmer, he declared, was "the same old bunk and piffle that we have heard here for the last two years."

The bill was assailed by many members as a sectional measure imposing upon the North a heavy burden no part of which was borne by the section represented by the majority leaders. In view of Chairman Kitchin's previous admissions, commented upon editorially in the last issue of The Iron Age, that the bulk of the tax would come from "north of Mason and Dixon's line," neither he nor his colleagues made any serious attempt to defend the bill from the charge of sectionalism.

The Senate Finance Committee took up the revenue bill as soon as it was passed by the House and will report it to the Senate after brief deliberation. While the bill will provoke much discussion, it is improbable that a filibuster will be organized against it, although it would be entirely practicable for a handful of Senators to prevent the passage of the measure at this session and it would be impossible to put such a bill through either House in the next Congress should a special session be called to consider revenue legislation.

W. L. C.

### Ella Furnace Stock Sold to Mudge & Co.

Individual interests connected with Pickands, Mather & Co., Cleveland, have sold their stock in Ella blast furnace, West Middlesex, Pa., to E. W. Mudge & Co., Pittsburgh, which firm will hereafter sell the product. Pickands, Mather & Co. will continue to operate the furnace. It is understood that plans are being made by a leading maker of ingot molds to erect a new plant alongside Ella furnace and take practically the entire output of the furnace in molten Bessemer iron to be made into ingot molds. The foundry at present is unable to meet the demand for ingot molds and increased capacity is greatly needed.

#### New Ferrotungsten and Ferrochromium Plant

The Tungsten Products Company of Maryland, Baltimore, Md., began operating a new plant early in January for making ferrotungsten and ferrochromium. The plant uses small electric furnaces and is located just outside of Baltimore and close to the ferrosilicon plant of the Shawinigan Electro Products Company, Highlandtown, Md. Satisfactory products are reported to have been made during the last month. Fairbanks, Morse & Co., 30 Church Street, New York, are the selling agents.

### The Steel Corporation Suit

Washington advices state that the Supreme Court has reassigned the hearing in the suit of the Government against the United States Steel Corporation for March 6, instead of Feb. 26, as originally planned. This action was taken because the court has arranged for a recess from Feb. 5 to March 5. The suit against the International Harvester Company will come before the court for hearing on the same day that the Steel Corporation case is heard.

Arrangements are being made by the Eddystone Steel Company, Leiperville, Pa., for the installation of a new 25-ton open-hearth furnace and a 10-ton crane. Other improvements are being considered because of the great increase in business.

A. M. Castle & Co., Chicago, jobbers in iron and steel, have purchased additional ground near their present warehouses on which a four-story warehouse is to be erected at a cost estimated at \$50,000.

# To Smelt Iron Ore in Texas with Natural Gas Fuel

To take advantage of the proximity of the large iron-ore field in northeastern Texas and the natural gas supply in northwestern Louisiana, the United States Reduction Company, Inc., has been incorporated in Delaware with a capital stock of \$400,000 and is constructing a plant at Shreveport, La., for demonstration purposes. A new process of employing natural gas for reduction of the ore in the place of coke, as in the blast-furnace process, is to be used, the invention of Charles S. Bradley, New York. Mr. Bradley is the inventor of the electrolytic cell for the production of aluminum, the arc process for the fixation of atmospheric nitrogen and the rotary furnace for the

production of calcium carbide.

The installation being made at Shreveport includes a rotary furnace similar to a cement kiln, 7 ft. in diameter and 36 ft. long, into which is introduced unconcentrated ore crushed fine. Natural gas is admitted at the other end of the furnace together with the necessary air supply. The ore and rock particles are brought to a red heat and in this state, without the necessity for fusion, it is stated, are deoxidized. The furnace discharges its contents to a conveyor which carries away the reduced iron particles and rock dust. The conveyor is equipped with a magnetic separator which picks up the iron particles and magnetically conveys these particles to a melting apparatus. In this conveying of the iron particles any non-magnetic matter picked off of the conveyor is

dropped back and discharged with the gangue.

It is expected that the plant under construction will produce some 20 tons of metal per day, and as soon as the information is secured as to the operating results from this plant, the Texas Iron & Steel Company, which controls some 50,000 acres of the ore field in Cass and Marion counties, is to undertake the construction of a plant on a large scale.

A deposit of iron ore, averaging about 56 per cent metallic iron, is available in the ore field. The natural gas will be brought from a new field just over the line in Louisiana, centering around Elm Grove, about 40 miles distant. It is estimated that this virgin field covers 35 square miles and contains 600,000,000,000 cu. ft. of gas at atmospheric pressure.

Benjamin F. Wood, vice-president and chief engineer of the United Gas & Electric Engineering Corporation, 61 Broadway, New York, is president of the company. A. V. Lane, vice-president of the American Exchange National Bank, Dallas, is vice-president. A. G. Elliott, Dallas, is treasurer, and Charles S. Bradley is a director.

#### Large Power Plant for Newport Mills

The Newport Rolling Mill Company, Newport, Ky., has commissioned J. D. Lyon, engineer, Union Central Building, Cincinnati, to prepare plans for a new power plant. When it is completed, the plants of the Newport Rolling Mill Company and the Andrews Steel Company will practically be electrified throughout. The improvements contemplated include the installation of two 3000-kw. Westinghouse generators in a power house adjacent to the Andrews Steel Company's mill, and current will be transmitted to the sheet mill about one mile distant, where, in addition to other equipment, two 1800-hp. motors, direct geared to the mills, will be installed. Falk gears will be used. It is hoped to have the proposed addition completed before July 1.

### Nagle Steel Company Buys Potts Bros. Plant

The historic plant of Potts Brothers, Ltd., Pottstown, Pa., which had been in that family for over 70 years, was purchased Feb. 1 by the Nagle Steel Company, Pottstown, of which L. F. Nagle is president. The buildings include plate and puddle mills, warehouse, dwellings and offices. Work will be started at once on remodeling of the plant, which has been idle for five years. The Nagle Company is also operating plants at Glasgow, Pa., and Rahway, N. J.

# Advances and Strikes

Although their wages have been advanced half a dozen times, from \$4 per ton to \$8, puddlers at the plant of the Reading Iron Company, Reading, Pa., made request Jan. 30 for an advance which will net them \$9.30 per day.

The Stowell Company, South Milwaukee, Wis., on Feb. 1 instituted a bonus system in favor of all employees who work by the day, to be in effect for an indefinite period. Each day laborer will receive a bonus of 10 cents per day, payable on the twelfth of each month, on condition that he works full time every working day in the month.

The Red River Iron Works, Chattanooga, Tenn, announces that on July 1 and Dec. 31 of this year it will credit each of its regular employees with a percentage of his 1917 earnings as a bonus. "If we are able to get coke to operate regularly," the statement says, "it will be a substantial addition to wages; if not it will necessarily be small, but it will be what we can afford."

The Alliance Machine Company and the Alliance Structural Steel Company, Alliance, Ohio, have voluntarily granted an increase of 10 per cent in the wages of their employees, except foremen and officials.

The Columbia Iron Works, Chattanooga, Tenn., has granted an 8-hr. day to its employees, at a minimum rate of 50c. per hr.

Five hundred machinists in the employ of the Pond Machine Tool Company, Plainfield, N. J., appointed a committee Feb. 5 to confer with shop officials regarding a desired increase in wages.

A number of molders in the employ of the Wheland Company, Chattanooga, Tenn., have struck, following the presentation of demands for a 9-hr. day and increased wages. Other departments of the plant continue in operation.

Employees in the foundry department of the Union Sanitary Mfg. Company, Noblesville, Ind., walked out Jan. 30 because eight men were brought from Louisville, Ky., and put to work in their department. The company says these men were not to take the place of any of the old but to make additions to the force because of increasing business. The company has had several similar experiences in the last few months.

### The New Westinghouse Plant at Essington

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., announces that the plot of ground re-cently purchased at Essington, near Philadelphia, will form a new industrial center for that company's interests. The site embraces about 500 acres, with a frontage of approximately a mile on the Delaware River. Additional transportation facilities will be afforded by tracks from the Pennsylvania and Philadelphia & Reading railroads. This new center will be devoted to the production of large apparatus, the first group of buildings being for power machinery, principally steam The initial turbines, condensers and reduction gears. development will cost about \$5,000,000 or \$6,000,000, occupying about one-fifth of the area of the entire plot. The group will consist of two large machine shops, an erecting shop for heavy machinery, forge shop, pattern shop and power house. Work will begin on these as soon as satisfactory building contracts can be placed. The number of employees to be engaged at the new plant has not as yet been definitely determined, but will number several thousand, and it may in the future equal the number employed at East Pittsburgh, which is over

The Committee of Ten, a temporary body organized about a year ago to draft a memorial to Congress and to take other steps to oppose legislation prohibiting time studies and premium and bonus payments in Government work, has been disbanded. The work is now being continued by a committee on industrial efficiency of the Chamber of Commerce of the United States.

# Pittsburgh and Nearby Districts

At a meeting of directors of the Carbon Steel Company, Pittsburgh, last week, the proposed plan of reorganization of the company was declared inoperative. It was proposed to take out a West Virginia charter and to have only preferred and common stock. The proposition called for the acceptance of 95 per cent of the present three classes of stock, but as this was not secured the plan was given up.

The American Sheet & Tin Plate Company is rushing work on the 10 hot tin mills being added to the Shenango works at New Castle, Pa., and it is hoped to have them ready for operating by July 1 at farthest.

At the annual meeting of the Metallurgical and Mining Section of the Engineers' Society of Western Pennsylvania, held in Pittsburgh last week, W. L. Affelder was elected chairman, and Frank B. Speller, vice-chairman. Previous to the election a general discussion was held on "The Possibilities of Smokeless Operation of Heating Furnaces and Soaking Pits." Among those who spoke were A. N. Diehl, Duquesne works, Carnegie Steel Company; Julian Kennedy, John S. Unger, Central Research Bureau, Carnegie Steel Company; M. F. McConnell, Mingo works, Carnegie Steel Company, and W. E. Snyder, American Steel & Wire Company.

The annual meeting of members of the Employers' Association of Pittsburgh was held Feb. 7. Isaac W. Frank, president United Engineering & Foundry Company, Pittsburgh, is also president of the organization. A. L. Humphrey, Westinghouse Air Brake Company, is vice-president. William Frew Long is manager, and Biddle Arthurs, Simonds Mfg. Company, is treasurer.

Officials of the Carnegie Steel Company at Youngstown have been notified that the United States Steel Corporation has made an appropriation of \$2,000,000 on which to start the building of a model town for employees at McDonald, south of Girard, where the Carnegie Company is building large steel bar, hoop and band mills. This initial appropriation is to provide for the building of about 350 dwellings for employees, to be constructed of stucco, brick and concrete, and to contain all modern conveniences; to sewer, pave and sidewalk all the streets; to provide an adequate lighting system; to develop a park system, etc. Work of construction will start as soon as possible.

At a meeting of the board of directors of the Superior Steel Corporation in Philadelphia, Jan. 30, James H. Hammond was elected chairman of the board; E. W. Harrison, president; H. F. Devins, vice-president; J. F. Hedges, secretary and treasurer; and Howard H. Henry, assistant secretary and assistant treasurer. The corporation is the holding company for the Superior Steel Company, Carnegie, Pa., operating hot and cold rolled strip steel mills. Officials of the Superior Steel Corporation and the Superior Steel Company are identical.

The United States Steel Casting Company, recently incorporated under the laws of West Virginia, with a capital of \$1,000,000, has purchased the plant of the National Steel Casting Company, New Cumberland, W. Va., and proposes to build several other steel foundries. Stockholders of the company met at Steubenville, Ohio, last week and elected officers as follows: Samuel Ungeleider, Columbus, Ohio, president; Jacob Adolph, Pittsburgh, vice-president; Ray Muslin, Johnstown, Pa., secretary; and Ralph B. Cohen, Steubenville, Ohio, treasurer. The steel-casting plant at New Cumberland was completed last October. The company is represented in the Pittsburgh district by Frank H. Zimmers, Hartje Building.

At a meeting of the stockholders of the General Fireproofing Company, Youngstown, Ohio, last week, it was decided to increase the capital stock from \$2,000,000 to \$4,000,000. The company proposes to make additions to its plants.

The Pittsburgh Steel Company has purchased a tract of 688 acres of coal lands in Cumberland Township, Pa. It is said close to \$500,000 was paid for the property.

The receivers of the J. V. Thompson coal properties have petitioned the court to be allowed to sell 202 acres to J. G. Butler, Jr., representing the Youngstown Sheet & Tube Company, for \$500 per acre. It is said that another large block of the land has been optioned to parties representing the Bethlehem Steel Company at \$327 per acre.

The Westinghouse Electric & Mfg. Company, which will build a large new plant at Essington, Pa., near Philadelphia, will soon send out inquiries for a large number of 100-ton, 50-ton and smaller electric cranes. The requirements of this plant will be huge, but the lists of tools wanted will not likely be sent out for some time.

The Mine Safety Appliances Company, Pittsburgh, has been incorporated, with a capital stock of \$100,000, for dealing in safety mine appliances and all kinds of apparatus for protecting and safeguarding machinery, etc. The incorporators are George H. Deike, John T. Ryan and Harrison D. Mason.

The National Forge & Tool Company, Erie, Pa., is in the market for a heavy single-head axle lathe in good condition.

### Quickwork Co. Sheet Metal Machine Builder

The Quickwork Company of Ohio has been incorporated with a capital stock of \$400,000 to take over and operate the sheet metal working machinery business of H. Collier Smith of Detroit. A plant has been purchased at St. Marys, Ohio, where rotary shearing, edging, wiring, beading, crimping, flanging, hammering and rolling machines for general work and rotary shearing machines, power hammers and machines for making fenders, hoods, tanks, radiators, etc., for automobiles, will be built. The general offices of the company will remain in Detroit, together with the sales and showrooms. There is no change in the personnel of the management, Mr. Smith retaining the controlling interest, and having active charge of the operations. He is president and manager. Other officers are: H. E. Groves, vice-president; A. F. Smith, secretary and treasurer; K. J. O'Leary, production manager; R. H. Sims, sales manager, and Harry G. Smith, head of the engineering department.

# Locomotive Orders

Orders for locomotives in the past week amount to 91. The New York Central has increased its order of 50, reported last week, to 60 from the American Locomotive Company and doubled its order of 45, also reported last week, from the Lima Locomotive Corporation. The American Locomotive Company has also taken an order for 30 locomotives for the Seaboard Air Line. Inquiries in the past week amount to 161. The Illinois Central contemplates purchasing 75; the Lehigh Valley, 56, and the Chicago & Northwestern, 30. Total orders for the month of January, not counting those enumerated above, were 766, of which 172 were for export.

### New By-Product Coke Plant in Southern Ohio

The Ironton-Solvay Coke Company, Ironton, Ohio, has been incorporated with \$2,000,000 capital stock by Frank R. Rhodes, Cincinnati; R. B. Parker, Syracuse, N. Y.; Nelson Weedon, Ironton, and others, to operate a coke plant with an initial capacity of 900 tons per day. A site of about 50 acres has been secured within the city limits of Ironton and work has already commenced on the foundations of the plant. Semet-Solvay ovens will be installed and it is hoped to have the plant in full operation within the next six months. Frank R. Rhodes is a member of the pig-iron and coke firm of Eaton, Rhodes & Co., Cincinnati.

It is stated that several Virginia blast furnaces that have heretofore run on charcoal pig iron may change over to making Bessemer iron if coke and Bessemer ore can be secured. One Virginia furnace interest is rebuilding its bee-hive coke ovens so that it can start a small stack that has a capacity of 50 to 75 tons per day.

# Machinery Markets and News of the Works

# MARKETS ARE QUIETER

# Uncertainty Surrounds Export Shipments

### General Electric Company a Large Buyer— Export Company Reports Large Sale to Foreign Motor Factory

The machinery market reports contain fewer interesting features than has been the case for a long time, but that general business is good is testified by the absence of any note of complaint. As for export shipments, activity in this direction cannot be expected until transatlantic shipping conditions are cleared up. As matters stand railroad trunk lines have refused to carry freight to the seaboard for export until given the word by the United States authorities. This makes conditions no worse because the roads have heretofore asked to be assured that ocean freight space was available before they accepted freight for abroad. At present, of course, conditions are far worse because of uncertainty as to how far Germany will carry out her threat to destroy indiscriminately, and also as to what steps will be taken to protect ships that may attempt

Despite existing conditions a New York exporting house has just booked an order for about 500 machines which are to equip a foreign motor factory.

Probably the largest buyer of recent weeks has been the General Electric Company, which has bought heavily to equip a plant at Erie, Pa., and has a large list before the trade of machines required to equip a new shop at Schenectady, N. Y.

Standard machine tools are still three to seven months behind in deliveries. An interesting sidelight is the scarcity of lathe chucks, the demand having been so great that even the stocks of supply houses have been exhausted.

In the Pacific Northwest an early start at spring mining is expected to create a lively demand for machinery used in that work.

The Imperial Munitions Board, Ottawa, Canada, is directing its attention to aviation, and will establish a plant at Camp Borden at a cost of \$3,000,000.

### New York

New York, Feb. 7, 1917.

Gaston, Williams & Wigmore, Inc., 140 Broadway, New York, in addition to other business recently received from its foreign branches, has had placed with it an order for the complete equipment of a motor factory. The order calls for 123 lathes, 81 milling machines, 63 grinding machines, 11 gear cutting machines, 13 planing machines, 89 drilling machines, 7 stotting machines, 79 turret lathes, 5 automatic screw machines, 15 boring mills and 13 shaping machines.

Domestic business is unquestionably quieter, and it is not helped by the numerous offerings of second-hand machinery, some of which comprise the equipment of entire plants. It is noticeable that some firms which are regular buyers of this class of equipment are not interested in the offerings. Single-tool sales continue fairly numerous.

Hoagland-Thayer, Inc., 800 Washington Street, Newark, N. J., is contemplating the equipment of a shop for the manufacture of an industrial electric motor truck.

The list of the General Electric Company for the equipment of a new shop at Schenectady, N. Y., is a large one even for that company to put out.

The Newport News Shipbuilding & Dry Dock Company, Newport News, Va., is in the market for a few machines, including large turnet lathes and one or two boring mills.

The Pennsylvania Railroad has revived a few of the inquiries the trade has had in hand for some time.

The Electric Service Supplies Company, Philadelphia, has received orders for supplying a line of American ships with special searchlights for flooding vessels with light while traversing danger zones at sea. About 20 searchlights are installed on each ship, making their flag and outline plainly seen by commanders of submarines or other ships.

Lathe chucks are scarce and difficult to obtain. With certain sizes and makes the stocks of supply houses have been exhausted, and the manufacturers can only make deliveries which are months away.

The Crippen-Rase Company, Rochester, N. Y., recently incorporated with a capital stock of \$40,000 by A. E. Rase, I. M. and A. J. Crippen, has established a plant at Rochester for the manufacture of phonograph disk record files, cabinets and similar specialties. Arthur J. Crippen, formerly factory superintendent of the Cutler Mail Chute Company, Rochester, is the inventor. Associated with him as officers and directors are Ellery A. Handy, Cogswell Bentley, David T. Ripton and J. D. Burns, treasurer, all of Rochester.

The plant of the Buffalo Corrugated Container Company, 25 Imson Street, Buffalo, was damaged by fire Jan. 21 with a loss of between \$40,000 and \$50,000, mostly to raw material. The machinery is now being rebuilt and the plant will be again put in operation about Feb. 15.

The Aluminum Goods Mfg. Company has had plans completed by the Lockwood-Greene Company, Chicago, for a six-story reinforced concrete building to be erected on a new site which it has purchased at Belmont and Ridgewood avenues, Newark, N. J. George Vits is president. The building will be 60 x 350 ft., and will cost about \$250,000.

The Lionel Mfg. Company, 48 East Twenty-first Street. New York, manufacturer of electrical toys, has had plans completed for additions to its factory on South Twenty-first Street near Clinton Avenue, Irvington, N. J., 77 x 78 ft., two stories and 39 x 53 ft., one story, estimated to cost \$20,000.

The Brockway Motor Truck Company, Cortland, N. Y., has had plans prepared for a one-story cement block addition to its machine shop, 50 x 200 ft. George A. Brockway

The Union Smelting & Refining Company, Fourteenth Street and Averue D, New York, has purchased 11 acres on St. Charles Street, Newark, N. J., on which it will erect at once a plant to cost about \$500,000. It will have about five times the capacity of its present plant and it is expected to be finished in eight months, when the company will remove to that place.

W. Ames & Co., Jersey City, N. J., are in the market for an alligator shear to cut 30 in. or more in length or 4 insquare steel, also for a 4 to 10-ton electric overhead crane of about 28-ft. span.

The Schwartz-Hermann Steel Works, Inc., Somerville, N. J., will purchase second-hand upright or portable boiler of 50 to 75 hp.

The Elmira Foundry Company, Elmira, N. Y., has secured options on about six acres opposite its plant on Main Street. Work on buildings to be erected on this tract will start soon and will greatly enlarge the operations of the company. It was recently reorganized and is said to be doing work for the Ceneral Electric Company. James D. McCann is president.

The Merrick Roller Bearing Company, Syracuse, has been incorporated with a capital stock of \$25,000 by A. L. Merrick, 249 South Avenue, E. L. Mooney and L. M. Beimmer to manufacture machinery, roller bearings, etc.

The John W. Jepson Company, Depew, N. Y., has established a factory at 15 Peach Street, Buffalo, for the manufacture of window shield cleaners for automobiles and other automobile accessories. John W. Jepson is president. The capital stock of the company is \$50,000.

The McKinnon Chain Company, Tremont Street and the Eric Railroad, Tonawanda, N. Y., is completing an addition to its plant, 96 x 130 ft., one and two stories, and a power house. W. L. Nathan is secretary.

The Modern Motor Parts Corporation, Millbrook, N. Y., has been incorporated—capitalized at \$70,000—to manufacture motor vehicles, aeroplanes, etc. M. J. Carew and A. G. Ziesk, Millbrook, and J. E. Hauronic, 1400 First National Bank Building, Chicago, are the incorporators.

The Cayuga Steel Company, Auburn, N. Y., has completed arrangements for the erection of a manufacturing plant in Auburn.

The Hilliard Clutch & Machine Company, 102 West Fourth Street, Elmira, N. Y., is completing a one-story addition to its machine shop, 30 x 50 ft., to cost \$8,000.

The Electro-Abrasive Company, Niagara Falls, N. Y., has been incorporated with a capital stock of \$300,000 to manufacture abrasives and chemicals, and will equip a plant. R. G. Wright, J. F. Johnston and J. M. Givin are the incorporators.

The Warren Lubricant Company, Buffalo, has been incorporated with a capital of \$50,000 to manufacture lubricating oils, greases, etc. M. M. Sanderson, 22 Maurice Street, Buffalo; A. J. Squier, 27 Coenties Slip, New York, and H. N. Squier, Scranton, Pa., are the incorporators.

The Cary-Hewitt Metal Company, Buffalo, has been incorporated by Richard Cary and George W. Hewitt.

The plant of the Forsyth Metal Goods Company, 308 The Terrace, Buffalo, was damaged by fire last week to the extent of \$25,000.

The State Superintendent of Public Works, W. W. Wotherspoon, Albany, N. Y., is advertising for bids until Feb. 20 for the construction and equipment of a power station at Lock 29, Barge Canal, Palmyra, N. Y., under canal contract 141.

Fort Ann. N. Y., Wilber M. Main, president Board of Trustees, will take bids about March 1 for a pumping station.

Plans are being drawn for a foundry, 60 x 100 ft., to be erected by the Emerson Motor Company at Kingston, N. Y.

The Schoharie Valley Light & Power Corporation, Esperance, N. Y., has been incorporated with a capital of \$1,000,000. B. and E. C. Grantier, Esperance, and F. M. Landers, Duanesberg, are the incorporators.

Bids are being taken for a 3-story and basement factory at Solvay, N. Y., by Pass & Seymour, from plans of Russell & King, architects, Syracuse.

The Central Dyestuff & Chemical Company, Plum Point Lane, Newark, N. J., will build a new four-story concrete addition to its plant to cost \$80,000. The company has increased its capital from \$250,000 to \$750,000 to provide for extensions.

The New Jersey Electric & Auto Supply Company, Newark, N. J., has been incorporated with a capital of \$25,000 to manufacture electrical supplies for automobiles. Jerome J. Rafferty, National State Bank Building, Newark, and H. L. and M. B. Doolittle are the incorporators.

The Loew-Victor Engine Company, Chicago, Ill., manufacturer of automobile, boat and aeroplane motors, is negotiating for property on Frelinghuysen Avenue, Newark, N. J., to be used for the erection of a branch manufacturing plant.

The Robinson-Roders Company, 27 New Jersey Railroad Avenue, Newark, N. J., manufacturer of feather goods, is building a new auxiliary electric power station for plant operation to cost about \$25,000.

The United States Rubber Company, New York, has acquired a three-story factory at 122-8 Adams Street, Newark, N. J., as a plant for the manufacture of rubber specialties. It is said that about 350 hands will be employed for initial operations. The plant will be under the management of A. E. Jury.

The Newark Rivet Works, 262 Lafayette Street, Newark, N. J., is building a two-story addition, 64 x 72 ft.

F. H. Lovell & Co., Arlington, N. J., manufacturers of brass goods, have awarded contract for an addition to their plant on Forest Street, and for improvements in the present structure, to cost about \$13,000.

The Portable Machinery Company, Passaic, N. J., has been incorporated with a capital stock of \$40,000 to manufacture machinery. Frank R. Allen, 283 Main Avenue, Passaic; J. L. and A. M. Wentz, are the incorporators.

The Egyptian Lacquer Mfg. Company, Kearny, N. J., has awarded contract for the erection of three additional reinforced-concrete buildings at its new plant on Passaic Avenue, to cost \$50,000. The Turner Construction Company, New York, has the contract. The company was formerly located at Rahway and is establishing its new plant to replace the factory recently destroyed by fire.

The Union Terminal Cold Storage Company, Twelfth Street, Jersey City, N. J., has increased its capital from \$450,000 to \$750,000, for business extensions.

The Vacuum Oil Company, Bayonne, N. J., will build two reinforced-concrete additions to its lubricating oil manufacturing plant in the Constable Hook section. The structures

will be three-story and two-story, to cost \$14,800 and \$11,000, respectively.

The Tidewater Oil Company, Bayonne, N. J., will build a new boiler plant addition to its works at Constable Hook.

Joseph A. Miller, Rutherford, N. J., has incorporated in Delaware the Sterling Tire Corporation, with capital stock of \$2,500,000, to manufacture rubber tires. Otto Basten, East Rutherford, and Bartlett Greene, Passaic, N. J., are also interested in the company.

Lehman Brothers, 401 Jefferson Street, Hoboken, N. J., metals, have acquired a four-story factory building at Fourth and Jefferson streets and plan the installation of a smelting plant for scrap-iron and metal reduction.

The Knight Mfg. Company, Hoboken, N. J., has been incorporated with a capital of \$50,000 to manufacture roofing materials. Jacob Straus, 1 Newark Avenue, Hoboken; Frederick Lange, Jr., Hoboken, and Joseph Knight, Fairview, are the incorporators.

The Canadian Car & Foundry Company, 120 Broadway, New York, is reported to be planning the erection of a new plant near Newcastle, Del., consisting of 38 buildings, to replace its plant at Kingsland, N. J., recently destroyed by fire.

The Standard Underground Cable Company, High Street, Perth Amboy, N. J., manufacturer of insulated wire and cables, will build a new four-story addition to its plant to cost about \$10,000.

The Aeromarine Plane Company, East Keyport, N. J., has commenced the erection of a new plant,  $150 \times 300$  ft., for the manufacture of aeroplane engines.

The B. & Z. Tool Company, Franklin Street, Jamesburg, N. J., is planning extensions and improvements in its foundry to increase the capacity.

The Hilliard Mfg. Company, Johnson Avenue, Tottenville, Staten Island, N. Y., manufacturer of gages and precision tools, is building a new two-story addition, 30 x 55 ft., to increase the capacity of the plant.

# Philadelphia

PHILADELPHIA, PA., Feb. 5, 1917.

The American Manganese Bronze Company, Holmesburg Junction, Philadelphia, manufacturer of brass and bronze castings, forgings, etc., will build a new one-story foundry, 50 x 60 ft., to cost \$9,000, and a two-story pattern storage shop, 20 x 40 ft., to cost \$3,900.

The Midvale Steel Company, Philadelphia, has had plans prepared for a 60-ft, brick and concrete addition to its foundry.

The William Adams Foundry Company, 960 North Ninth Street, Philadelphia, iron and steel castings, has taken out a permit to make alterations in its plant, necessitated through recent fire, Jan. 21, causing loss estimated at about \$10,000.

The Electric Service Supplies Company, Seventeenth and Cambria streets, Philadelphia, manufacturer of electrical specialties, has awarded contract for a three-story and basement addition, 60 x 80 ft.

The S. A. Ashman & Son Company, 2300 East Tioga Street, Philadelphia, manufacturer of iron and steel forgings, has awarded contract for a one-story addition, 24 x 45 ft.

R. M. Barr, Philadelphia, has incorporated in Delaware the American Toy & Novelty Mfg. Company, with a capital stock of \$150,000, to manufacture toys and novelties. W. C. Van Dyke, Germantown, Philadelphia, and R. R. Fernow, Cynwyd, Pa., are also incorporators.

George Flint, Philadelphia, will make alterations and improvements in his foundry at Hedge and Gillingham streets, to cost about \$1,500.

P. F. Gormley, Washington, D. C., has submitted a low bid for the erection of the new machine shop to be built at the League Island Navy Yard, Philadelphia, at a cost of \$608,032. The structure will be eight stories, 200 x 700 ft.

The Quaker City Iron Works, Salmon and Tioga streets, Philadelphia, will build a new one-story boiler and engine house addition, 40 x 60 ft., to cost \$5,000.

The American Metal Works, 314 Armat Street, Philadelphia, will build a two-story addition, 40 x 110 ft., to its plant at Germantown.

The Nice Ball Bearing Company, Land Title Building, Philadelphia, manufacturer of bearings, pulleys and hangers, has acquired property at Hunting Park Avenue and Henry Street, 428 x 987 ft., for a consideration of about \$71,000, and plans the erection of a new plant.

Dennis & Watson, Trenton, N. J., operating a machine shop at Lafayette and Peace streets, have acquired property formerly occupied by the Trenton Machine Specialty Company on Parker Avenue, including a portion of the machinery and other equipment. The new owners will make extensive improvements to provide increased capacity, removing their

present shop to the new location. William Watson and John D. Dennis are the proprietors. Duncan Macphee, operating the Trenton Machine Specialty Company, has arranged for the removal of that business to a new plant at Fieldsboro, near Bordentown, with increased capacity for the manufacture of special machinery.

The Camden Boiler Works, Camden, N. J., has been incorporated with a capital of \$10,000, to operate a local plant. J. E. Boyle, W. Dusine and H. Ladage are the incorporators.

The Sun Shipbuilding Company, Chester, Pa., will build a new two-story brick and concrete addition, 50 x 200 ft.

The Manheim Mfg. & Belting Company, Manheim, Pa., manufacturer of rubber belting and kindred specialties, has filed articles of incorporation with a capital of \$100,000.

M. M. Pfantz is president.

Announcement was made by the Philadelphia Chamber of Commerce, Feb. 1, that it had influenced the Cleveland Steel Barrel Company of Cleveland to choose Philadelphia for a branch. The branch will be located near Forty-sixth Street and Woodland Avenue and by April at least 100 men will be employed.

A new building, 40 x 100 ft., at the plant of the Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., is nearly finished. L. F. Shoemaker of Pottstown and L. H. Focht & Son of Birdsboro have the contracts. The plant of the company now covers 15 acres. The new building will be used for casting steel ingots.

Fitzgibbon & Crisp, Inc., Calhoun Street, Trenton, N. J.. recently increased its capital stock from \$100,000 to \$200,000 to take care of its growing automobile body business, which is being increased by the building of steel hand and power dump bodies for contractors and builders. L. L. Woodward is secretary and treasurer.

The chief of the Bureau of Yards and Docks, Navy Department, Washington, is having plans prepared for a onestory addition to the gun factory at the navy yard, Washington, 200 x 500 ft., estimated to cost \$600,000.

The Kelly & Jones Company, Greensburg. Pa., is in the market for two second-hand 44-in. Grant turret, chucking and turning machines, formerly built by the Grant Tool Company, Franklin, Pa.

The Alvord Reamer & Tool Company, Philadelphia, has been incorporated with \$10,000 capital stock to manufacture machinery, tools, castings, forgings, etc. The incorporators are Frederick T. McGuire, 6830 Gorston Avenue; Harry A. Stone, 9834 Anderson Avenue, and George A. Kurrie, 1321 Spruce Street, Philadelphia.

Howard S. Grimes, 429 Law Building, Baltimore, Md., is in the market for one 16-in. one 12-in. and two sensitive drill presses, five spinning lathes, 12 polishing heads, one small blower and air compressor and plating equipment.

The machine shop, electrical department, tool room and store room at the plant of the Virginia Bridge & Iron Company, Roanoke, Va., were considerably damaged by fire last week.

The Scott Paper Company, Chester, Pa., will erect a twostory steel, brick and concrete building which will be used as boiler rooms. Another addition will also be built to its plant.

The Sun Shipbuilding Company, Chester, Pa., is receiving bids on a two-story frame shop,  $50 \times 200$  ft., to be built at the foot of Morton Street.

### Chicago

CHICAGO, ILL., Feb. 5, 1917.

John W. Harrison, president National Car Coupler Company, Attica, Ind., has organized a new company which will build a plant at Murphysboro, Ill. The company is to receive \$125,000 bonus from 100 business men of that city. The plant will be a duplicate of that at Attica, which employs 650 men and is one of the largest steel foundries in Indiana. The new concern will be known as the Harrison Steel Company. It has signed contracts for a steel foundry to be erected by Sept. 1 next, at a cost of \$300,000. The company at Attica has just let a contract to the East St. Louis Bridge Company for the steel work on an addition to the Attica plant, 100 x 200 ft.

The R. M. Eddy Foundry Company, Chicago, has increased its capital from \$150,000 to \$200,000.

The Powdered Coal Engineering & Equipment Company, McCormick Building, Chicago, has leased property at Washington Boulevard and Western Avenue and will expend from \$15,000 to \$20,000 in remodeling the building for use as a demonstration plant.

The Wisconsin Steel Company has purchased property

at Torrence Avenue and 110th Street, Chicago, 470 x 327  $_{\rm ft_n}$  which will be used for the extension of its works.

The Wangler Boiler & Sheet Iron Works, Litchfield, Ill, has purchased property on which it will erect a new factory

The Machine Tool & Supply Company, Davenport, Iowa has been organized with a capital of \$10,000 by M. W. Iles, J. H. Gerdes and J. Reed Lane.

Fire at the plant of the American Brick & Tile Company, Mason City, Iowa, caused a loss of \$50,000.

The Bowen Transit Company, Omaha, Neb., has been incorporated with a capital of \$50,000 by Charles A. Bennett and A. D. Bowen to manufacture gasoline and motor-driven freight and passenger cars.

The Guenther Mfg. Company, St. Paul, Minn., has been organized with a capital of \$25,000 to manufacture machines, implements and tools. The incorporators are G. E. Guenther, M. R. Guenther and Emil Kroening.

# Indianapolis

INDIANAPOLIS, IND., Feb. 5, 1917.

The Studebaker Corporation, Detroit, Mich., will shortly begin the erection of a large continuous gray-iron foundry in South Bend, Ind., for making automobile and vehicle castings, and also a new forge shop. The foundry will be a two-story building, 140 x 450 ft., and will have three cupolas. The forge shop will be 160 x 200 ft. Conveyors, cranes and other foundry equipment will be required. James L. Stewart, 30 Church Street, New York, is the contracting engineer.

The Whitfield Ensilage-Packer Company, Indianapolis, has been incorporated with \$25,000 capital stock to manufacture ensilage packers and machinery. The directors are Victor, C. D. and B. S. Whitfield, all of Okeman, Okla.

The Esterline & Angus Engineering Company, Indianapoufacture machinery. The directors are Everett F. McCoy, lis, has been incorporated with \$10,000 capital stock to man-Harold B. Johnson and Quincy A. Myers.

The plant of the Pioneer Box Company, Crawfordsville, Ind., manufacturer of wire-bound boxes, recently destroyed by fire, will be rebuilt. Edward E. Ames is president. The company also has plants in East St. Louis and Detroit.

The Vacuum Ice Machine Company, Logansport, Ind., has increased its capital stock from \$25,000 to \$50,000.

The Stults Motor Company, Fort Wayne, Ind., has been incorporated with \$25,000 capital stock to manufacture motor vehicles. The directors are A. W. Stults, J. R. Stults and David L. Henniner.

The Globe Accessories Company, Greensburg, Ind., has been incorporated with \$100,000 capital stock to manufacture automobile accessories. John W. Judkins, Cambridge City, Ind., is president; A. E. Campelin, Chicago, is vice-president; R. E. Edwards, Richmond, Ind., is secretary and treasurer and L. W. Gillespie, Greensburg, is sales manager.

The Concord Foundry, Elkhart, Ind., has been incorporated with \$50,000 capital stock to do general foundry manufacturing. The directors are John G. Schacht, Simeon E. Schacht and Ernest A. Skinner.

The Richmond Malleable Castings Company, Richmond, Ind., has been incorporated with \$100,000 capital stock to do a foundry business. The directors are William J. Blackmore and George B. Calvelage of Indianapolis and John M. Lontz of Richmond. The company occupies part of the old M. Rumely plant.

The Hebron Light & Service Company, Hebron, Ind., has been incorporated with \$25,000 capital stock by George W. Giddley, J. F. Cole and George A. Harrop.

The Sweg Auto Lock Company, Evansville, Ind., has been incorporated with \$5,000 capital stock to manufacture a patented automobile lock. Frank Schwegman, Richard C. Weller and E. App are the directors.

The Brazil Motors Company, Brazil, Ind., has been incorporated with \$150,000 capital stock to manufacture trucks, tractors and other motor vehicles. The directors are William M. Zeller, John F. Brown and Lewis McNutt.

The Lyric Talking Machine Company, South Bend, Ind., has been incorporated with \$50,000 capital stock to manufacture talking machines. The directors are Russell W. Geyer. Lenn J. Oare and B. M. Cox.

A waterworks company is being organized at Newton, a suburb of Lawrenceburg, Ind., with \$100,000 capital stock. Jacob C. Spanagel has been elected president and Edward J. Metzger, secretary.

The Sedan Body Company, Union City, Ind., which is erecting a plant containing 54,000 sq. ft. of floor space, plans to complete it next June. C. C. Adelsperger is president

and general manager and C. C. Koontz is secretary and treasurer. It is stated that about 200 men will be employed at the start.

### Detroit

DETROIT, MICH., Feb. 5, 1917.

Machinery firms expect an immediate increase in orders due to the close of the Chicago automobile show and the return of officials to Detroit. Dealers are handicapped by the continued embargo on machines coming by way of Toledo, but this is expected to be lifted the middle of this week. Deliveries on standard machines are still uncertain, from three to seven months being required.

The Saxon Motor Car Company, Detroit, will push work on its new factory and the installation of machinery, due to a \$200,000 fire last week which completely destroyed the present plant. The new factory was to be completed May 1, but every effort will be made to put it in operation before that time. The company employs 2000 men. Harry W. Ford is president.

The Kales Stamping Company, Detroit, has increased its capital stock from \$100,000 to \$200,000 and has changed its name from the Kales-Haskell Company.

The Automatic Products Company, Detroit, has increased its capital stock from \$62,500 to \$200,000.

The Bunday Bedding Company, Lansing, Mich., has increased its capitalization from \$10,000 to \$20,000 to enlarge its capacity. Plans call for additions to its storage department and shop.

The Alliance Brass & Foundry Company, Detroit, recently organized, has established a plant at 124 Post Avenue, and has taken over from the Allyne Brass Foundry Company the manufacture of plumbers' brass goods. A. Manche is president and E. W. Berry, vice-president.

The Western Carbureter Company, Alma, Mich., has been incorporated with a capital stock of \$120,000. Contracts for factory buildings have been let and it is expected to install the machinery in less than 60 days.

The Detroit Tool Company has moved to its new factory at 1487 Antoine Street, Detroit. Increased business necessitated larger quarters.

The Liberty Body Company, Detroit, is being organized to manufacture commercial bodies. It is understood that prominent men in the industry will be connected with the company,

The Kalamazoo Sanitary Mfg. Company, Kalamazoo, has been organized with a capital of \$350,000. It has absorbed the Enameled Tank Company and it is stated will immediately begin the erection of a pottery plant which will cost \$200,000. Carl H. Zwermann is president and E. C. Brigham is first vice-president.

The Lansing Wagon Company, Lansing, Mich., has changed its name to the Lansing Body Company and will build new shops at once. It specializes in motor omnibus, hearse and ambulance bodies.

The Auto Specialty Mfg. Company, St. Joseph, Mich., has announced that work on its new factory is completed and manufacturing will begin at once.

The Benton Harbor Malleable Foundry Company, Benton Harbor, Mich., has re-elected its former officers and is contemplating further expansion to its plant.

The St. Joseph Iron Works, St. Joseph, Mich., is planning an additional factory building which will increase its floor space 30 per cent.

The Adrian Steel Casting Company, Adrian, Mich., is completing a new foundry plant.

The Modern Machine Tool Company, Jackson, Mich., has increased its capital stock from \$5,000 to \$20,000.

The Hensley Trolley & Mfg. Company, Detroit, has doubled its capital stock of \$25,000.

The Porter Body Company, Ann Arbor, Mich., has been incorporated by Gilbert E. Porter, Ray C. and Glen E. Killins with \$10,000 to manufacture automobile bodies.

The Detroit Door & Sash Company, Detroit, has been incorporated with \$25,000 to manufacture sash, doors, etc. The stockholders are Roswell G., Edgar A., Edgar G. and Carrie G. Curtis,

The All-Season Body Company, Marshall, Mich., with offices at Jackson, Mich., has been incorporated with \$500,-900 to manufacture detachable automobile tops and accessories. J. A. McAvoy, Mansel Hackett, Ralph Trese and F. R. Bothwell, all of Jackson, Mich., are the incorporators.

The Burroughs Adding Machine Company, Detroit, Mich., has increased its capitalization from \$5,600,000 to \$16,500,000.

The Consolidated Truck & Tractor Company, Detroit, has been incorporated at \$2,000 to manufacture automobile en-

gines. The stockholders are Zach C. Barber, F. M. Keeton and W. E. Tarsney.

The Enterprise Foundry Company, Detroit, has been incorporated with a capital of \$30,000 to manufacture iron and aluminum castings. The stockholders are Charles W. Carolin, George S. Cuddy and John Goshenhofer.

The Western Carbureter Company, Alma, Mich., recently incorporated with a capital stock of \$120,000, has let contracts for a factory. Machinery will be installed within 60 days.

The Brisk-Blast Mfg. Company of St. Louis, manufacturer of automobile accessories, will move its plant to Monroe, Mich. The company has temporarily leased a plant and will take steps at once for the erection of a new factory building.

The Alco Foundry & Machine Company, Hillsdale, Mich., has been organized with a capital of \$25,000.

The Consolidated Vending Machine Company, Grand Rapids, Mich., has been incorporated with a capital of \$30,000.

The Field Motor Company, Grand Rapids, Mich., has been organized with a capital of \$500,000 and will manufacture an improved type of gasoline motor especially designed for tractors.

### Milwaukee

MILWAUKEE, WIS., Feb. 5, 1917.

Considerable improvement in the freight traffic situation has been noted the past week by Milwaukee machine-tool builders, who have been able to move their goods with better facility and so reduced the high pressure on warehouse room. The car shortage has been a serious problem to the local trade for nearly two months, but relief is said to be now in sight. The situation accentuated the sold-up condition of all shops by delaying deliveries of much-needed tools, both on domestic and export account. The activity of the railroads in buying shop equipment has not had any appreciable effect on Milwaukee trade, in which milling machines are a feature. Such tools are wanted by a variety of users, who continue to order single tools or small lots for replacements or extensions and appear satisfied to get delivery when possible. Some concerns make it a practice to place new orders as soon as an old order is filled, so that machines keep coming as fast as the shops can turn them out. All available capacity is fully occupied for the remainder of the year.

The Chicago & Northwestern Railway will build a new roundhouse and shops at Madison, Wis., to cost \$275,000.

The Bloomington Electric Light & Power Company, Bloomington, Wis., has authorized the installation of a 40-kw. generator and a 60-hp. engine, which will double the present output. S. E. Pearson is president.

The Jackson, Schmitz & Shanke Mfg. Company, Appleton, Wis., has been organized with a capital stock of \$20,000 by H. A. Schmitz, Sr., George J. Schmitz and H. A. Schmitz, Jr. It will manufacture a counter-balanced tool holder for use in mining and tunneling work. For the present it will be manufactured in Chicago, where a shop has been opened on Des Plaines Street. The general offices, however, will be at Appleton.

The Four Wheel Drive Automobile Company, Clintonville, Wis., reports that orders on hand Jan. 1 were of such volume as to occupy all of the recently enlarged facilities for more than six months. Further extensions will be made as soon as the frost leaves the ground. W. A. Olen is president.

The Board of Commerce, Marshfield, Wis., is considering a proposition from a manufacturer of boilers, digesters, structural steel, bridges, etc., now located in a southern Wisconsin city, to relocate in Marshfield. It is proposed to form a \$100,000 corporation, local capital to subscribe for \$30,000 of the stock. The name of the firm and its present location are withheld.

Peter Schneider has sold his machine-shop at Jericho, Wis., to August Nett.

The Auto Body Company, Appleton, Wis., recently organized and occupying temporary quarters in the former Schneider shops, is rebuilding the structures at Fremont and Jefferson streets for permanent use. Much new wood and metalworking equipment will be installed.

The Richardson-Phenix Company, 122-123 Reservoir Avenue, Milwaukee, maker of lubricating devices, will build a one-story addition, 30 x 30 ft.

The Kempsmith Mfg. Company, manufacturer of milling machines, Milwaukee, will take bids through Vaughn & Meyer, consulting engineers, Majestic Building, after Feb. 8 for a 200-kw. direct-connected generator and engine unit, which will double the capacity of its power plant. Paul Thomas is general manager.

The J. W. Hewitt Machine Company, Neenah, Wis., is having plans prepared for a shop addition.

The Western Steel & Iron Works, De Pere, Wis., will build an addition to be used for administration, storage, etc. C. W. Streckenbach is president.

The Sanitary Ice Company, West Allis, Milwaukee, will award contracts soon for an artificial ice plant costing \$35,000. The building will be 50 x 150 ft. and will contain a 10 to 20-ton refrigerating unit. M. Cudahy is president.

The Marathon Electric Mfg. Company, Wausau, Wis., is erecting an addition to its plant which will increase the capacity from 75 to 100 per cent. The new quarters will be ready about March 1. Practically all equipment has been ordered

Herman Metzig, Berlin, Wis., is establishing a small machine-shop and will specialize in oxy-acetylene cutting and welding work.

The Rex Mfg. Company, Chicago, manufacturer of bathtubs, water heaters, and farm waterworks systems, has opened negotiations with business men at Walworth, Wis., with a view of relocating its works. The company is capitalized at \$50,000 and requires local subscriptions for \$20,000 of the issue.

The Segelke & Kohlhaus Company, LaCrosse, Wis., will build a three-story addition,  $65 \times 170$  ft., to their woodworking factory and sash and door mill.

The Western Hardware Mfg. Company, 858 Third Street, Milwaukee, specializing in tool grinders, is contemplating important extensions to its plant and facilities. New capital has been introduced.

The F. M. Emerson Company, 82 Wisconsin Street, Milwaukee, structural steel engineer and contractor, has taken occupancy of its new shop and office building at 439 Atwater Road, East Milwaukee.

W. H. Stewart & Son, Delavan, Wis., operating an automobile and farm machinery repair plant, is making plans for a new warehouse and machine-shop to replace the structure destroyed by fire with a loss of \$20,000 two weeks ago.

Joseph D. McCord, Milwaukee, representing the American Steel Window Company, has organized the Joseph D. McCord Company, with a capital stock of \$15,000 to manufacture metal and other building materials and specialties. The offices are located at 610 Majestic Building.

The Pawling & Harnischfeger Company, Milwaukee, has taken an order for ten 25-ton electric traveling cranes for the Lehigh plant of the Bethlehem Steel Company.

The R. L. Kenyon Company, Waukesha, Wis., manufacturing fiber furniture, portable houses, campers' goods, etc., is preparing to build a large factory addition in the spring at a cost of about \$25,000.

Scott Barnes, Richland Center, Wis., has moved his machine shop into larger quarters in the buildings formerly occupied by the Al. Vreeland machine works.

### Cleveland

CLEVELAND, OHIO, Feb. 5, 1917.

The General Electric Company has placed contracts for the machinery equipment for its new foundry in Erie, Pa. It is understood that the purchases exceed \$500,000. A new Cleveland company to make automobile parts has purchased considerable equipment and will erect a plant. Local machinery houses have received an inquiry from a New York dealer for a large amount of machinery for export. Inquiry for small lots of machines is fairly plentiful and dealers report a good volume of single tool business.

The Kemco Mfg. Company, Cleveland, maker of starting and lighting systems for automobiles, is moving its plant to Salem, Ohio.

The K & M Brass Aluminum Castings Company, Cleveland, has purchased a  $6\frac{1}{2}$ -acre site at East Ninety-third Street and Lauren Avenue, on which it plans to erect a plant.

The Lincoln Electric Company, Cleveland, has purchased a site adjoining its present plant on which it plans to erect an addition.

The Briggs Mfg. Company, Cleveland, maker of automobile bodies, has placed contract for the erection of a four-story addition,  $96 \times 204$  ft.

The Prospect Auto Top & Painting Company, Cleveland, plans to erect a one-story factory, 87 x 187 ft.

The Kelly-Springfield Tire Company, Akron, Ohio, has an inquiry out for machinery equipment for its tire mold department, including 9 boring mills, lathes, milling, drilling, and shaping machines, and some wood-working machinery.

The India Rubber Company recently organized by Akron capitalists has acquired a site in Magadore, near Akron, Ohio,

where it plans to expend about \$100,000 in a plant and equipment. J. M. Alderfer is the principal stockholder.

The Akron Rubber Mold & Machinery Company, Akron, will increase its capacity and add some new equipment.

The Torbensen Axle Company, 1115 East 152nd Street, Cleveland, will build and equip a machine-shop addition of about 30,000 sq. ft. of floor space. The contract for the building has been let but orders for the machinery, shafting etc., have not yet been placed. It is in the market for first-class automatic chucking and screw machines, grinders, heavy drill presses, milling machines, small tools, etc.

The Holmes Automobile Company, recently organized in Canton. Ohio, is preparing plans for a new plant, the contract for which will be placed shortly.

The Gordon Tire & Rubber Company, Canton, has acquired 3½ acres of land adjoining its plant and is preparing plans for an extension.

The Willys-Overland Company, Toledo, Ohio, has acquired the plant of the Libby-Owens Sheet Glass Company, consisting of several large buildings, and it is reported will equip it to manufacture automobile parts. The glass company will move its plant to Charleston.

The Massillon Electric & Gas Company, Massillon, Ohio will spend approximately \$300,000 in plant extensions.

The Ohio Steel Products Company, Mineral Ridge, Ohio, maker of steel tubing, contemplates an addition to its plant.

The Fremont Mfg. Company, Fremont, Ohio, has been incorporated with a capital stock of \$20,000 to manufacture plumbers' tools.

The Power Mfg. Company, Marion, Ohio, which is building a new plant for the manufacture of gas engines, has its foundry about ready for operation and in addition to its present building program, is contemplating the erection of another machine shop.

The East Iron & Machine Company, Lima, Ohio, has plans under way for several additions. C. C. Mosher has been made secretary and general manager.

C. V. Martin and others are interested in a new plant that is being established in the Cary Block, Norwalk, Ohio, in which light rubber products will be manufactured.

The Union Chain & Mfg. Company, Seville, Ohio, at its recent annual meeting, re-elected all of its officers. Its sales in the past year showed an increase in excess of 800 per cent over those in 1915, and plans for further expansion are now under way. Additional machinery to the amount of \$25,000 will be purchased.

# Cincinnati

CINCINNATI, OHIO, Feb. 5, 1917.

The domestic demand for machine tools shows no signs of any let-up. One firm reports that if it booked all the orders offered it would have sufficient work to keep its plant in operation practically through the entire year. A general average of orders already accepted would mean about four months' work for all shops. Special machinery is also in good demand and lately paper manufacturing concerns have been buying a great deal of equipment for increasing the capacities of their plants. The present high cost of semi-finished and finished iron and steel parts has brought about a number of advances in prices on all kinds of machinery within the past six months. This same situation confronts the boiler and tank makers. Small electric generators and motors are in good demand, and late contracts placed for the larger units prove very encouraging to manufacturers of this class of equipment. A large amount of machine tool business is pending with the railroads, but confirmed orders are scarce as compared with the number of machines under negotiation.

The Cincinnati Grinder Company, Cincinnati, A. C. Hoefinghoff, president, has acquired a site adjoining its plant on Colerain Avenue and is having plans prepared for a new factory that will more than double its present capacity.

The Bickett Machine & Mfg. Company, Cincinnati, Charles A. Bickett, president, is adding to its machine shop equipment. The majority of the new machines to be installed will be of the company's own manufacture, but two electric traveling cranes are yet to be provided for.

The Charles Boldt Glass Company, Cincinnati, will soon commence work on the erection of a five-story brick and concrete building recently mentioned. The building permit taken out estimates the cost of the building at \$55,000.

The Cincinnati Car Company, Winton Place, Cincinnatisuffered a fire loss Feb. 1 estimated at over \$50,000. Quite a number of dynamos were destroyed and will have to be replaced or rebuilt.

It is currently reported, but not yet officially confirmed, that the Utility Car Company, Cincinnati, will remove its automobile factory to Madisonville, a suburb, and will in-

stall equipment for increasing the capacity of its present

The Weir Frog Company, Cincinnati, contemplates the rearrangement of its plant in Norwood, a suburb, and additional equipment will be installed to increase its present capacity nearly 50 per cent.

The Victor E. Knecht Foundry Company, Harrison, Ohio, has been incorporated with \$6,000 capital stock by Victor E. Knecht and others and has acquired the foundry of the Campbell Brothers Mfg. Company. Additional equipment for handling general jobbing work will be required.

The Davis Sewing Machine Company, Dayton, Ohio, has commenced work on its new forging plant addition. Revised plans call for a brick building, 55 x 300 ft., one story.

The Mead Pulp & Paper Company, Dayton, Ohio, has had plans prepared for extensive additions to its factories at Dayton and Chillicothe, Ohio. The addition to the Chillicothe plant is already under way and will be completed shortly.

The Standard Glass Products Company, Columbus, Ohio, is equipping a plant for the manufacture of automobile lamps and chemical laboratory supplies. J. X. Krumm is one of the principal incorporators.

The Shelby County Reduction Company, Sidney, Ohio, has been incorporated with \$10,000 capital stock, by S. C. Harden and others. Work has already commenced on a plant in East Sidney.

Langenberg Brothers, Beverly, Ohio, will erect a coldstorage and packing plant. Wood & Stephenson, architects, Marietta, Ohio, are preparing the plans.

The General Refractories Company, Olive Hill, Ky., is rebuilding its plant recently destroyed by fire.

The Wapakoneta Wheel Company, Wapakoneta, Ohio, is increasing the capacity of its plant to manufacture automobile wheels.

The Quickwork Company, St. Mary's. Ohio, contemplates enlarging its plant for the manufacture of automobile fenders. H. C. Smith is president.

The National Products Company, East Liverpool, Ohio, will purchase a 2-in. or larger upsetting and forging machine.

# The Central South

LOUISVILLE, KY., Feb. 5, 1917.

There has not been time, since the international developments of Saturday, for opinion to form or observations to be taken as to the possible effect of the rupture with Germany may bring about. Confidence in continued sound conditions and good business is everywhere expressed. New wood-working plants are being reported in some numbers and motor-driven equipment is specified in connection with those established where power is available. Coal and oil development projects continue to increase and constitute the source of a large proportion of inquiries and orders for supplies.

Charles W. Inman, Louisville, Ky., and others will incorporate with a capital stock of \$150,000 and with the aid of the Louisville Industrial Foundation will establish a factory at Twenty-eighth Street and Broadway for the manufacture of wood veneer and panels.

The Wirth, Lang & Borgel Mfg. Company, Louisville, Ky., has been incorporated with capital stock of \$20,000 and will establish a factory for the manufacture of store and office fixtures. Edward C. Wirth is president and Ernest Borgel vice-president and general manager.

The Red Chief Mfg. Co., Louisville, Ky., has increased its capital from \$10,000 to \$15,000. It manufactures an automatic wrench in addition to hand corn mills. George T. Cross 8 secretary.

An additional 2000-hp. turbine will be added to the power plant of the Kentucky River Power Company, which is constructing a steam-driven power plant at Louisville.

The Paragould Handle Mfg. Company, Paragould, Ark., will construct a branch handle factory at Bardwell, Ky., at a reported cost of several thousand dollars. John N. Lynch will be manager.

M.C.R. Clark, Clay, Ky., will establish an ice and cold-storage plant at Cannelton, Ind., at a cost reported to be

Bear Brothers, Madison, Ind., have purchased the machinery equipment of the Vevay Furniture Company, Vevay, Ind., and have leased the building. They will manufacture lawn swings, cedar chests, etc.

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The Hartsville Light & Ice Company, Hartsville, Tenn., has been incorporated with \$10,000 capital stock. C. M. Gwin, L. T. Littleton and others are the incorporators.

The Jakes Foundry Company, Nashville, Tenn., has been incorporated with \$10,000 capital stock, by Robert, J. W., E.

F. Jakes and others, to establish a foundry and machine shop.

The Tennessee Nu-Style Window Sash Company, Memphis, Tenn., has been incorporated with capital stock of \$10.-000 by W. D. Galloway, Joseph H. Creath, C. D. Richards and others.

# Birmingham

BIRMINGHAM, ALA., Feb. 5, 1917.

The call for machine tools is insistent and is very difficult to meet. Second-hand machinery dealers report a demand that they cannot begin to fill.

The Stockham Pipe & Fittings Company, Birmingham, will build an additional plant to make pipe and fittings to cost \$200,000. An 18-acre site has been secured.

The Jirama Ore Company, Gadsden, Eugene Weil, secretary, capital stock \$100,000, has purchased mineral rights to 5000 acres of iron ore land in Etowah County, which it will develop.

The Southern Sewer Pipe Company, Birmingham, is nearing the completion of its new pipe and other clay products plant, which replaces that burned in 1914. W. R. Leighton is manager.

The Valdosta Lighting Company, Valdosta, Ga., plans to improve its power station and cold-storage plant at a cost of \$100,000.

### Texas

AUSTIN, TEX., Feb. 3, 1917.

W. F. Gohlke, Austin, and associates, are organizing a company with a capital stock of \$20,000 to build a pulp mill in which cotton stalks will be used in the manufacture of paper, high explosives and celluloid goods. The site for the plant has been acquired near Waco.

The Freeport Sulphur Company, Freeport, which is owned by S. M. Swenson & Son, bankers, 61 Broadway, New York, is installing a fourth unit at its sulphur mine. Other machinery will be installed which will increase the sulphur output about one-third. The power plant consumes approximately 500,000 bbl. of crude oil per annum.

The Temple-Marlin Interurban Railway Company has located its proposed line that is to run between Temple and Marlin, a distance of 33 miles. The estimated cost of construction is \$450,000, including a power plant. S. D. Hanna is chief engineer.

The El Paso Electric Railway Company will spend approximately \$200,000 this year in the purchase of additional machinery for the power plant and for extending the streetlighting system.

The Landa Cotton Oil Company, New Braunfels, will install complete cotton-seed oil mill equipment in the new building it is erecting.

The Graham Mfg. Company, Longview, will rebuild its crate factory, recently destroyed by fire. The new plant will cost about \$70,000.

The City Council, Athens, will install additional machinery in the municipal waterworks plant at a cost of about \$25,000.

The Hygeian Mfg. Company, Dallas, will install a plant for the manufacture of chemicals at a cost of about \$26,000. E. F. Ballard is in charge.

## St. Louis

St. Louis, Mo., Feb. 5, 1917.

A slight halt was given to the machinery market as a result of the acute conditions developed by the German submarine situation, but it was more a sentimental effect of tenseness rather than any belief that any real setback would be the ultimate outcome. The requirements for extensions, replacement, etc., as well as new industrial demand, is known to be so great in this section as to occupy all the energies of representatives of equipment houses and machine tool dealers generally for a long time. The demand is largely for domestic needs and therefore not immediately affected by war requirements. Considerable equipment is involved in deals now pending, though no extremely large individual transactions are reported.

The Lightfoot Steel Corporation, Springfield, Mo., has been organized with a capital of \$100,000 by M. D. Lightfoot, O. T. Hamlin and H. R. Awbrey. The company will erect a plant 80 x 100 ft., to cost \$10,000.

The General Machinery Mfg. Company, St. Louis, has been incorporated with a capital stock of \$10,000 by James C. Jones, Jr., Frank A. Mohr and Edward W. Lake.

The Acme Boiler & Sheet Iron Company, St. Louis, has been incorporated with a capital stock of \$15,000 by Andrew J. Getz, Frederick Jones and others.

The Wagner Auto Lock Company, St. Louis, has been incorporated with a capital stock of \$50,000 by Paul Lehmann, Edward Wagner and Bernard Mohr.

A plant for the manufacture of oil well supplies will be built in St. Louis by the Frick-Reid Supply Company, Tulsa, Okla., which has acquired a site therefor.

The Burnes-McDevitt Machinery Company, St. Louis, Mo., has increased its capital stock to extend its operations.

The General Roofing Mfg. Company, St. Louis, has acquired the Mound City Paint & Color Company, the Gregg Varnish Company and the Lockport Paper Company, Niagara Falls, N. Y., and reorganized into the Certain-teed Products Corporation with a capital of \$25,000,000. It plans considerable plant increase and readjustment.

The Flexo Tire Protector Company, St. Louis, has been incorporated with a capital stock of \$50,000 by Cadwell L. Bishop, Palmyra, Mo.; Raleigh McCormick and Oscar H. Hentschel to manufacture auto accessories and special devices.

The Polar Wave Ice & Fuel Company, St. Louis, has bought a site which will be improved with an ice-making plant. I. C. Muckerman is president.

The New Era Engineering Company, Joliet, Ill., has increased its capital stock from \$200,000 to \$1,000,000 and changed its name to the Elgin Motor Truck Company.

John L. Zeidler, St. Joseph, Mo., will equip at Joplin, Mo., a cement tile manufacturing plant at a cost of about \$75,000.

Sweet Springs, Mo., will install an additional oil engine in the electric light plant and also add a generator. The mayor is in charge.

The Forrest City Ice & Coal Company, Forrest City, Ark., will install equipment for an ice-making plant of 20 tons per day capacity.

The St. Louis, Iron Mountain & Southern-Railway, E. A. Hadley, chief engineer, St. Louis, will equip a car-building plant at Argenta, Ark., and install a foundry. The total cost will be about \$200,000.

The Watts & Buell Furniture Mfg. Company, Green Forest, Ark., H. L. Watts, manager, is in the market for surfacers, tenoning, planing and shaping machines and other woodworking machinery.

The Empire Refining Company, Oklahoma City, Okla., will expend about \$1,500,000 in new pipe line and oil pumping station equipment, still further connecting its various plants.

Tulsa, Okla., will install equipment for a waste disposal plant and will receive bids at once for the machinery. Frank Newkirk can be addressed.

Walter O'Bannon, 1113 North Harvey Street, Oklahoma City, Okla., will equip a plant for the manufacture of carbon by burning natural gas and is in the market for machinery.

Checotah, Okla., has voted \$125,000 to be expended in enlarging and extending its waterworks plant. A. O. Johnson, mayor, is in charge.

W. A. Powers, Miami, Okla., is in the market for gas engine and other equipment for mining property.

W. E. Small, Corinth, Miss., is in the market for heading machinery for the manufacture of tight barrel stock; also dry kilns and other equipment.

The Charleston Cooperage Company, Charleston, Miss., F. S. Charlot, St. Louis, Mo., president, has acquired a site on which to equip a plant requiring about \$50,000 worth of machinery.

The Columbia Carbon Company, Monroe, La., will equip a plant to manufacture carbon at Spyker, La., about \$200,000 worth of machinery being wanted.

The Wilson Oil & Fuel Company, Shreveport, La., will equip a two-story garage, 80 x 187 ft., and install machine shop equipment to cost about \$20,000.

The Trans-Mississippi Terminal, J. A. Shepherd, New Orleans, La., general manager, will equip a roundhouse and repair shops at Westwego, La.

### The Pacific Northwest

SEATTLE, WASH., Jan. 30, 1917.

The demand for machinery is brisk. Extensive preparations are under way for opening up mining work in the early spring, and local machinery men are swamped with orders for equipment, both new and second-hand. Cannery equipment is in good demand. The number of new plants starting up have practically cleaned up the market on equipment of this nature.

General business conditions throughout this section are satisfactory.

The Bonner Water & Light Company, Bonners Ferry, Idaho, plans the installation of a new pumping station in the early spring. A. H. Featherstone is principal owner.

The Sloan Shipbuilding Company, Olympia, Wash, incorporated for \$1,000,000, has purchased a site in Olympia and work will commence at once on yards and slips. It has signed contracts for eight wooden vessels. Philip D. Sloan is president.

The Dominion Safe Works, Vancouver, B. C., plans the location of a manufacturing plant on Industrial Island, near Vancouver.

The Columbia Shipbuilding Company, Portland, Ore, plans the erection of a machine shop at its shipyards plant

The Earles-Cleary Lumber & Shingle Company, Bellingham, Wash., has been reorganized and incorporated under the title of the Puget Sound Sawmills & Shingle Company, with a capitalization of \$400,000. The company has been remodeling its South Bellingham mill since last October, and on Feb. 1 will resume operations. The entire plant has been electrified, and more than \$100,000 expended in improvements.

Veness & Shives, Winlock, Wash., plans to erect a lumber plant near Winlock, with a daily capacity of 25,000 ft.

The Milner-Twin Falls Land & Water Company, Twin Falls, Idaho, has been organized to construct canals and provide for the irrigation of 40,000 acres in the vicinity of Twin Falls. The Daniel Hays Company, Rock Island, Ill., is active in the enterprise.

Joseph Supple, F. A. Ballin and J. B. C. Lockwood, Portland, shipbuilders, have secured contracts for two composite vessels 300 ft. long, with a capacity of 4000 tons to be built for an Eastern corporation at a cost of \$750,000.

The Oregon-California Box Company, Klamath Falls, Ore, recently incorporated by A. J. Voye, M. S. West, B. W. Mason and Dwight Lumber Company, San Francisco, for \$40,000, has completed plans to take over the Savidge Brothers box factory. The plant will be remodeled, new equipment installed and will have a daily capacity of 50,000 boxes.

The Controlled Locker Company, Nampa, Idaho, recently organized, plans the erection of factory to manufacture a new device.

The Alberta Flour Mills, Calgary, Alberta, plans the erection of a flour mill with a daily capacity of 6000 bbl. and to cost \$1,500,000.

Dunning & Erich, Harrington, Wash., manufacturers of combined harvesters, will incorporate with a capital of \$300,000. Extensive improvements will be made to their plant.

The Valveless Rotary Pump Company, Oakland, Cal., has plans for the erection of a factory, to cost approximately \$150,000.

The Marine Iron Works, Seattle, has been incorporated with a capital stock of \$30,000 by P. C. Peterson, F. Batten and C. Nelson.

The Oregon City Foundry, Oregon City, Ore., has been incorporated with a capital stock of \$20,000 by John A. Roake. C. H. Roake and L. V. Roake.

The Montgomery estate, Portland, Ore., has taken out a building permit to erect three sets of ship construction ways on the grounds of the Albina Engine & Machine Works.

The Joe Fellows Yacht & Launch Company, Morman Island, Wilmington, Los Angeles Harbor, will build a one-story addition to its boat-building plant, 100 x 106 ft.

The Santa Paula Citrus Fruit Association, Eighth Street. Santa Paula, Cal., has acquired property on Fourth Street. and plans a packing plant with a capacity of about 1000 cars a year, estimated to cost \$50,000.

### Canada

TORONTO, ONT., Feb. 5, 1917.

The Canadian military authorities have given the use of Camp Borden for aviation instruction in connection with the new plan for the development of aviation in Canada by the Imperial authorities. The plan as now being worked out is a very large one, and will involve the expenditure of some millions of dollars in the construction of aviation plants in various parts of the dominion. This business is in the hands of the Imperial Munitions Board, Ottawa, of which J. W. Flavelle is chairman. Col. Bob Low has announced that the contract has been signed for the construction of the plant at Camp Borden, at a cost of \$3,000,000. Work will be commenced at once and the plant, which will be ready about April

15, will have a capacity of 188 machines. F. W. Baille of the Canadian Cartridge Company, Hamilton, has been appointed director.

Negotiations are being completed between the Chatham Bridge Company, Chatham, Ont., and the Pittsburgh Steel Company, whereby the plant of the former will be taken over and operated by the latter.

Justice Sutherland at Osgoode Hall on the petition of William Kennedy & Sons, Ltd., creditors to the extent of \$665, granted an order for the winding up of the Garland Mfg. Company of Hamilton, manufacturer of war munitions. The company was incorporated in January, 1916, with a nominal stock of \$100,000. N. L. Martin, Toronto, was appointed an interim liquidator.

Keenan Brothers, Ltd., Owen Sound, Ont., is in the market for a 250 to 300-hp. compound engine.

Construction work has been started on the erection of a steel plant on Ashbridges Bay, Toronto, for the Imperial Munitions Board under the supervision of the construction staff of the harbor commissioners.

The British Forgings Company, Ltd., Toronto, has taken out a permit for the erection of an electric plant at the foot of Cherry Street, at a cost of \$25,000 for the Imperial Munitions Board.

Swift & Co., Chicago, Ill., propose to erect an abattoir at Winnipeg, to cost \$3,000,000.

The Canadian Furniture Mfg. Company, Wiarton, Ont., will build an addition to its plant and install new machinery to cost about \$15,000.

Construction work has been started on the erection of an addition to the plant of the Canadian Shovel & Tool Company at Hamilton.

The Canadian Desmond-Stephen Mfg. Company, Urbana, Ohio, is making preparations for the erection of a plant at Hamilton for the manufacture of steam ejectors, etc.

P. C. Ketchersid, Wichita, Kan., is making arrangements for the establishing at London, Ont., of a factory for the manufacture of brooms, etc., to cost \$75,000.

Work will be commenced in the spring on extensions to the waterworks plant at Cayuga, Ont., to cost \$7,500. A plunger pump of 500 gal. per minute capacity will be purchased. Jackson & Lee, Brantford, Ont., are the engineers.

The Canadian Allis-Chalmers, Ltd., Rockfield, Que., has awarded the contract and work has been commenced on the erection of an addition to its forge plant.

The Champion Spark Plug Company, Toledo, Ohio, has opened a factory and office at 14 Sandwich Street West, Windsor, Ont.

John Coughlan & Sons, Ltd., are completing arrangements for assembling the necessary plant for the construction of the three steel steamers of 8000 gross tons, recently contracted to be built for Norwegian interests. The company's shipbuilding plant will adjoin its main steel works on False Creek, Vancouver, B. C.

The Ford Motor Company, Ford City, Ont., is making arrangements for a concrete addition to its plant at London, Ont., to cost \$25,000.

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The Vulcan Iron Works will erect a plant on False Creek, near Vancouver, B. C., on ground reclaimed by the Harbor Commission. The latest handling devices will be installed, a number of electric cranes will also be installed. The company has sufficient orders on hand to keep the plant operating for 12 months. A specialty will be made of Scotch marine boilers. The plant will cost \$200,000 and 100 workmen will be employed.

The Pembroke Machinery Company, Pembroke, Ont., will at an early date erect a machine shop to cost \$12,000.

The St. Catharines Brass Works, Ltd., George Street. St. Catharines, Ont., is building a foundry.

Large additions will be made to the plant of the Mueller Mrg. Company, Sarnia, Ont., and considerable new machinery will be installed.

The Deyo Macey Engine Company, Binghamton, N. Y., will establish a plant in Toronto for the manufacture of gas

The Canadian Steel Foundries, Ltd., Welland, Ont., has commenced the erection of an addition to its plant which will double the present capacity. The total improvements now under way, including machinery, will cost \$500,000.

The Hull Iron & Steel Foundries, Ltd., Hull, Que., propose to make additions to its plant which it is reported will cost

The Canadian Vickers, Ltd., Montreal, is building a large addition to its plant. J. W. Norcross is a director.

Construction work has been started on a fuse plant at Montreal for the International Mfg. Company, subsidiary of

the International Arms & Fuse Company, Bloomfield, N. J. It will be 350 x 370 ft., and will cost \$1,000,000.

The Dominion Aircraft & Mfg. Company, Montreal, is having plans prepared for a factory to cost \$200,000. W. H. Parker, 101 St. Luke Street, Montreal, is manager.

The Edmonton Power Company, Ltd., C. P. R. Block, Edmonton, Alberta, is making surveys for an 80-mile railway from Edmonton to its new power plant site. Construction work on the power plant will be started on the completion of the railway, in about a year. E. W. Bowness is manager and engineer.

The Board of Control, Toronto, is contemplating establishing coal docks and storage at a cost of \$2,000,000. Thomas McQueen, City Hall, is secretary.

The Jackson Lewis Company, 76 Adelaide Street, West, Toronto, has been awarded the general contract for a group of seven factory buildings to cost \$500,000 for the Canadian Aeroplanes, Ltd. J. M. Lyle, 19 Avondale Road, Toronto, is architect.

Beatty Brothers, Fergus, Ont., are in the market for new and second-hand machinery to be installed in its foundry to be erected at London, Ont., including steam pumps, boilers, cupolas, motors, tumbling mills, steam engines, etc. W. G. Beatty is in charge of buying.

The Huntley Mfg. Company, Ltd., Tillsonburg, Ont., has been incorporated with a capital stock of \$50,000 by Charles G. Hammond, Albert B. Chapman, Silver Creek, N. Y.; William H. Bennett, Tillsonburg and others to manufacture milling, canning and similar machinery. It has secured the premises formerly occupied by the Tillsonburg Electric Car Company and will install machinery for a branch factory.

The Canadian S. K. F. Company, Ltd., 47 King Street West, Toronto, has been incorporated with a capital stock of \$50,000 by Allan H. MacCaffray, Hartford, Conn.; Percy O. G. Janes, James D. Becking and others to manufacture ball bearings, etc.

The Hitch Brothers Company of Canada, Ltd., Windsor, Ont., has been incorporated with a capital stock of \$50,000 by Albert J. and Charles H. Hitch of Windsor; Joseph S. Hitch, Ridgetown, Ont., and others, to manufacture paperhanging machines, tools, etc.

Beach Motors, Ltd., Ottawa, Ont., has been incorporated with a capital stock of \$100,000 by Benson C. Beach, Edwin A. Beach, William H. Courtney and others.

The C. H. Bangs & Co., Ltd., London, Ont., have been incorporated with a capital stock of \$40,000 by Clarence H. Bangs, Lawrence C. Howell, Frederick J. Appleton and others to manufacture automatic vending machines, etc.

The Metal Craft Company, Ltd., Grimsby, Ont., has been incorporated with a capital stock of \$40,000 by Frank P. Macklem of Toronto, Hugh David Walker and Everard B. Darley of Grimsby and others to manufacture sheet-steel and other metal specialties. It will erect a plant to cost \$3,000 and install \$3,000 worth of machinery.

The Farm & Dairy Machinery Company, Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by Henry H. Davis, 10 Adelaide Street East, Edward H. Brower, Howard V. Hearst and others to manufacture farm and dairy machinery, implements, tools, etc.

The Timberland Lumber Company, New Westminster, B. C., will start the construction of a sawmill to have capacity of 100,000 ft. daily, and to cost \$200,000. J. G. Robson is managing director.

The Russell Motor Car Company, King and Mowatt streets, Toronto, will erect an addition to its factory to cost \$14,000.

The Channel Chemical Company's plant at 369 Sorauren Avenue, Toronto, was damaged by fire Jan. 25 with a loss of \$25,000. The company manufactured mops, etc. Robert Watson is proprietor.

# Government Purchases

WASHINGTON, D. C., Feb. 5, 1917.

The Department of Agriculture will receive sealed proposals until noon Feb. 13 for one second-hand vertical boiler of not less than 10 hp. and one fully equipped second-hand motor-driven crane and hoist complete, of 5-ton capacity at 35-ft. radius, for the kelp-handling plant at Summerland, Cal. Proposals should be addressed to Dr. J. W. Turrentine, Arlington Hotel, Santa Barbara, Cal.

Bids will be received (date not set) by the Bureau of Accounts and Supplies, Navy Department, Washington, Schedule 700, for two main air pumps, and schedule 701, for one air compressor, all for Philadelphia; schedule 713, for one 30-in. motor-driven engine lathe for Mare Island.

#### NEW TRADE PUBLICATIONS

Feed Water Heaters.—Harrison Safety Boiler Works, North Philadelphia Station, Philadelphia, Pa. Catalog No. 710. Size, 6 x 9 in.; pages, 106. Treats of the uses of open heaters in connection with the heating, metering and softening of water for boiler and other purposes. After explaining the amount of fuel that can be saved by the use of exhaust steam to heat feed water and presenting a diagram by which the percentage of fuel saving in any case can be easily ascertained, the essential parts of an open feed water heater are considered. This is followed by chapters on heating boiler feed water in condensing steam power plants, the effects of open heaters in connection with exhaust steam heating and drying systems, exhaust steam heating in connection with condensing steam power plants, the utilization of an open feed water heater as part of a hot process water softener, the softening of boiler feed water in condensing power plants, the metering of water in open heaters and the heating of water for industrial purposes other than boiler feed. The catalog is illustrated with numerous halftone and line engravings of the heater, its various parts, methods of installation and views of plants in which it is in use.

Motor Trucks.—B. F. Goodrich Company, Akron, Ohio. Fifth edition of the pamphlet "Motor Trucks of America." Contains actual photographs of each make of truck, with detailed specifications of the different models. This handbook is not designed to displace the manufacturer's own literature, but occupies a broader field, as it gives the reader an opportunity to study each make of truck separately or in comparison with others.

Steel Plate Construction.—Hammond Iron Works, Warren, Pa. Calendar hanger measuring 14 x 22 in. The calendar is exceptionally free from advertising, the only thing being a reproduction of the company's frademark.

Pickling Machines.—Mesta Machine Company, Pittsburgh, Pa. Bulletin M. Mentions an improved form of pickling machine for the removal of scale or other substances from castings, wire colls, strip steel, pipe, stampings, small forgings, cartridge cases, gun parts, automobile frames and parts, hollowware and various other iron, steel, brass and copper products. A number of views of the machine, which is built so that one or more arms can be employed for lowering the material into the pickling bath, supplement the description of the machine. Among the points upon which special emphasis is laid are economy in the use of the steam employed for raising the material from the pickling solution and the ability to use two pickling baths without increasing the labor required.

Flood Lighting.—Western Electric Company, 195 Broadway, New York City. Folder. Illustrations and descriptive matter explain the application of flood lamps for lighting factory and railroad yards, excavations, pig-iron piles, etc. The two styles of lamps for indoor and outdoor use are illustrated and the various features pointed out.

Heat Treating Furnaces.—Bellevue Industrial Furnace Company, Detroit, Mich. Catalog. Size, 9 x 12 in.; pages, 70. Lists and illustrates a line of standard furnaces and accessories employing either oil or gas for the heat treating of metals. These include furnaces for heating, case hardening, annealing, preheating, tempering, lead or cyanide hardening, babbitt melting and high-speed steel. Adjustable tire and rim heaters and brazing tables, rod end furnaces, gas rivet heaters and forge furnaces for buildozer work, flue welding, etc., are illustrated, together with enameling ovens, firebrick, oil and gas burners, etc.

Air Meter.—New Jersey Meter Company, Plainfield, N. J. Folder. Concerned with a meter for determining the amount of compressed air used by pneumatic tools, rock drills, sand blast apparatus, pile hammers, etc. An illustration of the meter, which is built in two sizes for measuring from 10 to 300 ft. per min., and a partial list of users are included. An illustrated description of the meter appeared in The Iron Age, April 1, 1915.

Vertical and Horizontal Milling Machines.—Bickford Machine Company, Greenfield, Mass. Circular. Gives a brief general description of a vertical and horizontal milling machine with hand and power feed, which was illustrated in The Iron Age, July 20, 1916. In the design of the machine special attention has been paid to the convenience of the operator. The text is supplemented by engravings of the machine and some of its parts, and a condensed table of specifications is included.

Structural Steel Shapes.—Joseph T. Ryerson & Son, 30 Church Street, New York City. January stock list. Gives a list of the beams, angles, plates, bars, etc., carried in stock for immediate shipment, with the weights, prices and extras,

and the line of metal working machinery and small tools handled. A feature of the booklet is the use of a thumb index. This, in addition to carrying the name of the material listed in any particular section, contains the number of the first page. This arrangement, in connection with the alphabetical index furnished, enables any one of the lines listed to be located easily.

Hammers.—United Hammer Company, 141 Milk Street, Boston. Catalog. Lists a line of power hammers, operated by an adjustable crank that permits the stroke to be lengthened or shortened at will. The various features of the line, such as simplicity of construction, economy of power and floor space, adaptability to various requirements, ease of adjustment, large range of work and durability, are briefly touched upon, followed by illustrations with brief descriptions and specification tables of the different styles. Mention is made of a tire welding attachment and a special type of hammer for forks. A number of engravings showing the character of work done by the hammers are included.

Washer Press.—Southwark Foundry & Machine Company, Philadelphia. Circular. Pertains to the Mason press for making washers and other stamped specialties from scrap or new sheets and plates. The description of the press, which was illustrated in The Iron AGE, Nov. 2, 1916, is supplemented by engravings of the various sizes and a view of the different forms of scrap plate that are used. Condensed tables of specifications and standard washer sizes are included.

Cotton Belting.—Stanley Belting Corporation, 32 South Clinton Street, Chicago. Pamphlet. Calls attention to a line of cotton belting for power transmission, conveying and elevating work. Among the advantages claimed for the belting are freedom from stretch, flexibility, uniform thickness and low initial cost. A table showing the horsepower transmitted by the belting for various speeds and thicknesses is included, and mention is made of the different types of fasteners that can be used and the classes of work for which they are best suited.

Worm Gearing.—Albro-Clem Elevator Company, Philadelphia. Circular. Relates to the distinctive characteristics and practical importance of the Hindley type of worm gearing. The special feature of this gearing is the shape of the worm outline which conforms to the periphery of the wheel. A number of views of gearing of this type supplement the text matter in the circular.

Screws, Bolts and Nuts, Etc.—National Screw & Tack Company, Cleveland. Catalog. Size, 5% x 8 in.; pages, 132. Lists and illustrates a large line of products, including steel and brass wood and machine screws, bolts of all types, a large range of special bolts and screws, nuts, rivets, riveted keys, cotters, tacks for various purposes and staples. Tables showing the approximate weight of the various products with areas of square and round bars, dimensions of threads, different wire gages, etc., are included.

Hammer Drills.—Sullivan Machinery Company, Peoples Gas Building, Chicago. Bulletin No. 70A, second edition. Describes a line of rotating hammer drills which are made in five different styles and the mounting and equipment employed with them. The standard drill, which has automatic steel rotation and is intended for the general run of rock drilling, is made with a hollow piston, an air tube, a tube for use with steam and with a water tube for cleaning the holes, the last being intended for use in drifting. The mountings supplied are a shell and cradle type with feed screw and a pneumatic feed. An auger type drill is also made for use in soft ground. A brief account of the development of the drill is given, followed by a complete description of its construction and operation. The text of the bulletin is supplemented by numerous engravings of the drills and their parts and views of them in use.

Electric Light Hangers.—Thompson Electric Company. 5606 Euclid Avenue, Cleveland. Pamphlet. Deals with an automatic safety disconnecting hanger for incandescent, are or flood lamps. A special feature of this hanger, which was illustrated in The Iron Age, Aug. 17, 1911. Is the fact that the lamp can be lowered to the ground for cleaning, and that when this is done the circuit is positively broken, thus safeguarding the employee. A number of views of the different types of hangers are included.

Wrought-Iron Pipe.—A. M. Byers Company, Pittsburgh. Bulletin No. 27. Relates to the resistance to corrosion of the black and galvanized tubing, casing and line, drill and drive pipes made by this company. The experience of a number of practical men is quoted and an explanation of the resistance to corrosion is presented. It is brought out in the bulletin that average experience and not exceptional cases should be taken as the basis of comparison of the life to be obtained, and sheets, nails, wire and other iron and steel products should also be considered rather than pipe alone.

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